



U.S. Fish & Wildlife Service

Midway Atoll National Wildlife Refuge

Historic Preservation Plan 2010

Seaplane Hangar, Midway Atoll NWR - USFWS Photo



Midway Atoll

National Wildlife Refuge

Historic Preservation Plan 2010

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Acknowledgments

Over the past decade many people have contributed to the preservation of historic resources on Midway. Refuge managers are on the frontlines, defending the resources and making the tough decisions on how funding is expended. When the U.S. Fish and Wildlife Service participated in the initial transfer meetings with the Advisory Council on Historic Preservation, Hawaii SHPO, interest groups, veterans' groups and the Navy, the Service embraced its responsibility toward historic properties and saved many buildings slated to be demolished by the Navy.

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Glossary of Acronyms and Abbreviations

ARRA.....	American Recovery and Reinvestment Act
BEQ.....	Bachelor Enlisted Quarters
BOM	Battle of Midway
BOQ.....	Bachelor Officers' Quarters
BOS	Base Operating Services
BRAC.....	Base Realignment and Closure Act
CAA.....	Civil Aeronautics Authority
CC.....	Current Condition [ranking]
CD.....	Compatibility Determination
Council	Advisory Council on Historic Preservation
CPCC	Commercial Pacific Cable Company
CRT.....	Cultural Resources Team [FWS]
CSP.....	Midway Conceptual Site Plan (see also Site Plan)
DEW	Distant Early Warning
EO.....	Executive Order
FAA.....	Federal Aviation Authority
FCC.....	Federal Communications Commission
FOMA	Friends of Midway Atoll
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
GPS.....	Global Positioning System
HABS.....	Historic American Building Survey (HABS)
HPP	Historic Preservation Plan
HR	Historic Resources [Action Plan – strategy prefix]
HVR	Historical Value Ranking
IMMF.....	International Midway Memorial Foundation
MMP.....	Monument Management Plan
MOA	Memorandum of Agreement
Monument.....	Papahānaumokuākea Marine National Monument
MPC	Midway Phoenix Corporation
MILS.....	Missile Impact Location System

NAF Naval Air Facility
 NAS..... Naval Air Station
 NHL..... National Historic Landmark
 NHPA National Historic Preservation Act
 NPS..... National Park Service
 NOAA..... National Oceanic and Atmospheric Administration
 NRHP National Register of Historic Places
 NSGA..... Naval Security Group Activity
 NWHI Northwestern Hawaiian Islands
 NWR National Wildlife Refuge
 OIC..... Officer in Charge
 PA..... Programmatic Agreement
 PRPA Paleontological Resource Preservation Act
 PT Patrol Torpedo
 ROR..... Refuge Operations Ranking
 SAT..... Save America’s Treasures
 SHPD..... State Historic Preservation Division
 SHPO State Historic Preservation Officer
 Site Plan..... Midway Conceptual Site Plan (see also CSP)
 SOI Secretary of the Interior
 SOSUS Sound Surveillance System
 UTM..... Universal Transverse Mercator
 VSP..... Visitor Services Action Plan
 WWII World War II

Chapter 1

Introduction



Albatross and Instant Pillbox on Eastern Island (B. Maxfield, 2006-P1120033).

1.1 Introduction

Midway Atoll National Wildlife Refuge (NWR) is located within Region 1 of the U.S. Department of the Interior, Fish and Wildlife Service (FWS). Situated at the northern extent of the Hawaiian Islands, approximately 1,250 miles northwest of Honolulu, Midway comprises a roughly circular outer reef approximately 5 miles in diameter that encloses a central lagoon and two main islands, Sand and Eastern (Figure 1). Sand Island contains the highest number of historical resources as well as visitor facilities (Figure 2). Eastern Island contains no operational facilities except a boat dock (Figure 3).

The refuge on Midway was first established in 1988 in an overlay role while the Naval Air Facility was still in operation. The Naval Air Facility was closed on October 1, 1993, under the Base Realignment and Closure (BRAC) Act of 1990. (P.L. 101-510, as amended). The property was officially transferred to FWS on October 31, 1996, and all naval personnel withdrew from the atoll in June of 1997. Decisions regarding the treatment of Midway's historic properties during BRAC included demolishing six structures and recommendations for additional removals were deemed an adverse effect and led to a Programmatic Agreement (PA) in 1996. Terms of the PA were completed in 1999 with FWS preparation of the original Historic Preservation Plan (HPP) (Speulda et al. 1999).

Chapter 2 of this document discusses the connection of this plan with other plans and pertinent federal regulations. Two recent designations, the Battle of Midway Memorial (67 FR 743, 2002) and the Papahānaumokuākea Marine National Monument (Monument) (73 FR 73599, Dec. 3, 2008), further highlight the unique qualities and significance of Midway Atoll. Therefore, this Historic Preservation Plan 2010(HPP-2010) has been updated to meet the changes in FWS operations and partners, including the National Oceanic and Atmospheric Administration (NOAA). The HPP-2010 is linked to the Visitor Services Plan, the Midway Conceptual Site Plan, and the Monument Management Plan (MMP), while ensuring compliance with the National Historic Preservation Act (NHPA). Where relevant, strategies discussed within the MMP are addressed here along with the regulatory standards provided by the NHPA and the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (SOI Standards).

Chapter 3 presents a historic context for understanding Midway's historic properties. Chapter 4 provides an inventory of Midway's historically important properties, nearly all of which have been evaluated as eligible to the National Register of Historic Places (NRHP). Chapter 5 presents the current condition and treatment options developed for the HPP-2010, linking FWS goals for historic preservation with the habitat and operational plans at Midway Atoll NWR. And, Chapter 6 summarizes the 2010 treatment recommendations with action items for implementing the plan and ensuring compliance with NHPA.

1.2 Midway Atoll National Wildlife Refuge Purposes, Mission, and Goals

Midway Atoll NWR was established by Executive Order, to:

maintain and restore its natural biological diversity; to provide for the conservation and management of fish and wildlife and their habitats within refuge boundaries; to provide opportunities for scientific research, environmental education, and compatible wildlife dependent recreational activities; and to recognize and maintain the historical significance of Midway Atoll.

Executive Order 13022.

The mission of the Midway Atoll NWR is “to preserve, protect and restore the biological diversity and historic resources of Midway Atoll, while providing opportunity for wildlife-dependent recreation, education and scientific research.”

To meet the purposes established in the Executive Order and elucidated in the mission statement, six goals have been identified as important to successful management:

- 1) manage for the conservation and recovery of threatened and endangered species of animals and plants;
- 2) restore and manage habitat, including the remediation of impacts from prior human use, to support healthy populations of indigenous migratory birds in their natural diversity;
- 3) protect and maintain the natural diversity of marine habitats and their associated animal and plant communities;
- 4) operate and maintain facilities, in an environmentally sensitive manner, in cooperation with the contractor;
- 5) provide opportunities for wildlife-dependent recreation, education, and scientific research; and
- 6) preserve and interpret the unique historical resources of Midway Atoll.

The establishing legislation for Midway Atoll NWR contains a goal encouraging historic preservation. This goal recognizes historic resources as important topics for public interpretation along with wildlife. In addition, Section 110 of the National Historic Preservation Act institutes an affirmative role for agencies, charging them with specific responsibilities with respect to historic properties. Several of the responsibilities stipulated in Section 110 are especially applicable to Midway Atoll NWR, including:

Use historic properties. Prior to acquiring, constructing, or leasing buildings for purposes of carrying out agency responsibilities, each Federal agency shall use, to the maximum extent feasible, historic properties available to the agency (16 U.S.C. 470 et seq.).

1.3 Implementation of the Historic Preservation Plan-1999 to 2009

The Navy identified and evaluated historic buildings, structures and objects on Midway prior to transferring the property to the FWS in 1996. In 1999, FWS created the first Historic Preservation Plan establishing a treatment protocol for each of the 63 historic properties. The 1999 plan endeavored to maintain the historic properties in a manner consistent with the Navy’s status quo.

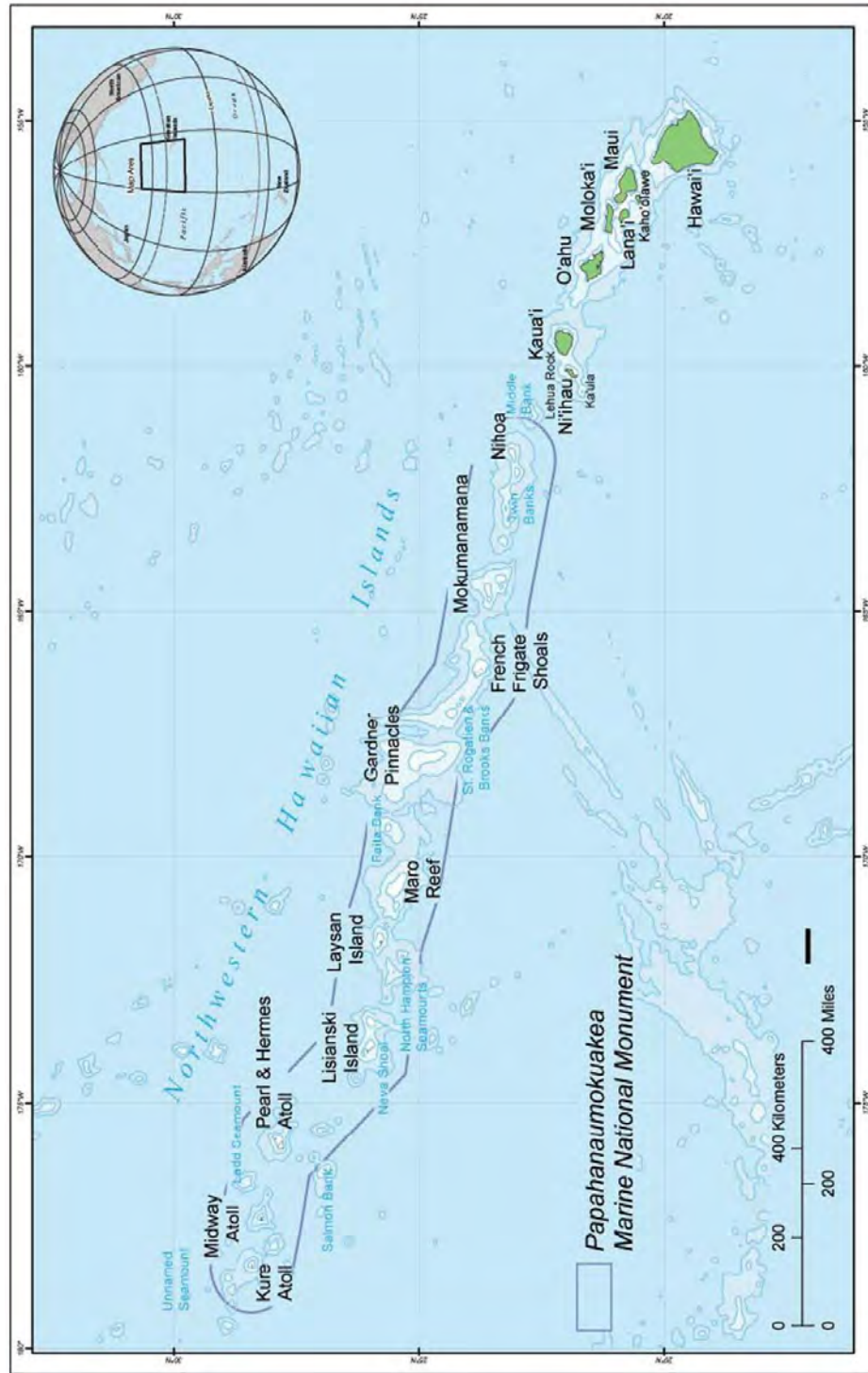


Figure 1. Hawaiian Archipelago and Midway Atoll National Wildlife Refuge.



Figure 2. Sand Island Map with Historic Properties Identified (map prepared by NOAA).

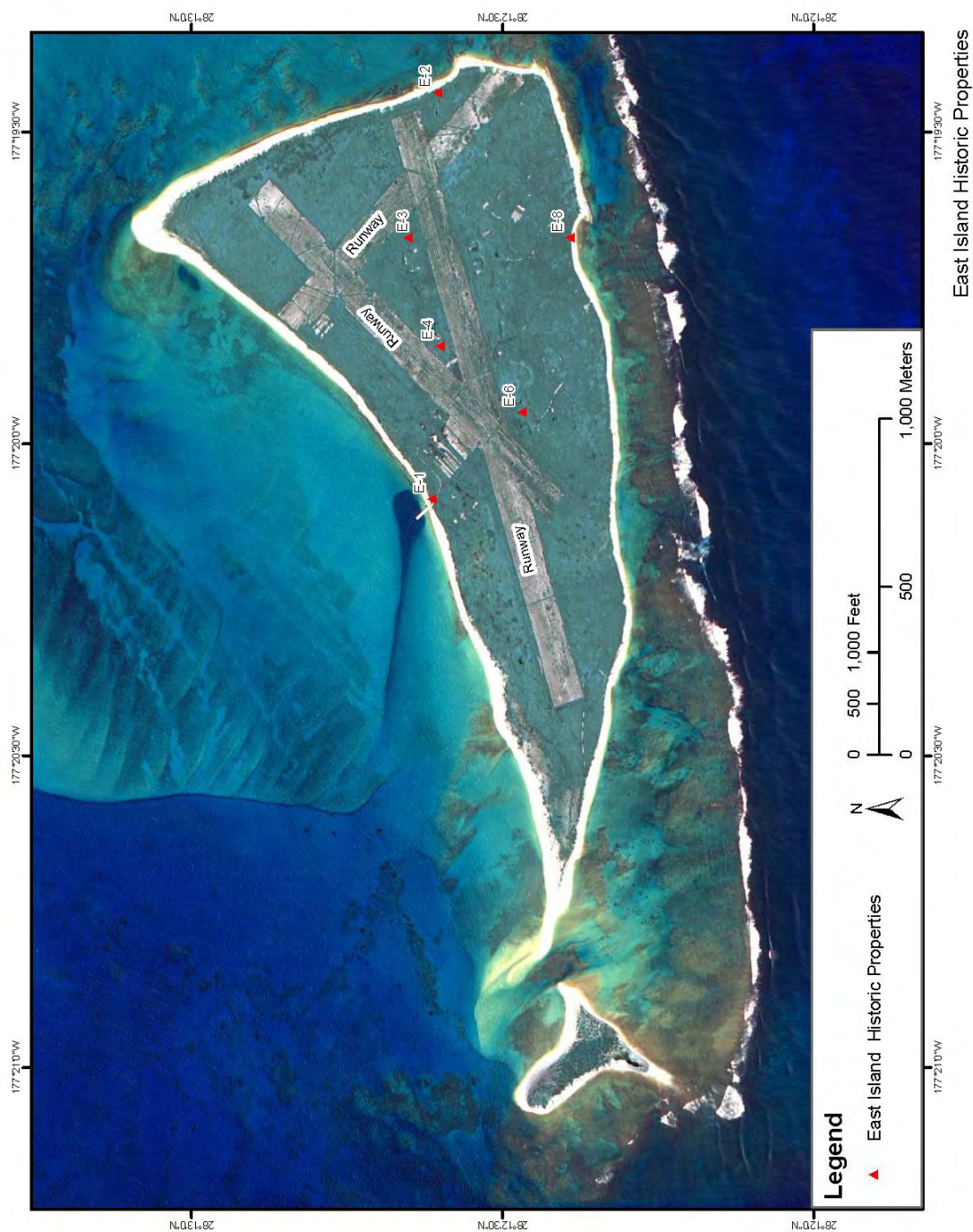


Figure 3. Eastern Island Map with Historic Properties Identified (map prepared by NOAA).

No historic buildings have been demolished and in general all of the buildings that were in use in 1999 are still being used. Two barracks were initially planned for reuse by the on-island contractor, but the plans were later dropped. Two of the shop buildings have been abandoned because of structural instability caused by termites. Only a portion of the Theater-mall building is still in daily use. Conversely, three properties that were scheduled to be abandoned in 1999 are now in use, including the Paint Shop (342), Torpedo Shop (363) and Brackish Water Reservoir (S5247).

The “Secure” category that was accomplished by the Navy was supposed to leave each resource with an envelope that was waterproof and entrances closed off. On Midway, buildings without adequate protection from water infiltration deteriorate at an exponential rate due to the harsh, wet environmental conditions.

The “Leave as-is” was a category for resources that were identified to have little functional reuse value, but were substantial enough to remain intact for many years. Over the past decade the Leave as-is treatment has created unintended safety issues with spalling concrete and peeling lead based paint.

The “Fill” category applies to resources that have a subterranean cavity, such as a pillbox, which were filled with sand. This treatment is unchanged, except that at some point, these structures may eventually be classified as a ruin. The objects identified for “Relocation” are still in need of a secure location.

Submerged resources were not addressed in the 1999 HPP except to note that when resources were discovered they would be preserved *in situ*.

Historic Preservation at Midway 1999-2009

In 1998, FWS and Oceanic Society began sponsoring Historic Preservation Projects with Elderhostel volunteers. The projects were supervised by an historic preservation specialist. Activities included restoring the Eastern Island 3-inch gun; stabilizing Battery C; and treating the 5-inch guns in the memorial park with rust inhibiting paint. The FWS also repaired the roofs on the Officers’ housing.

The FWS applied for and received funding from the National Park Service’s Technical Assistance Grants program for a detailed structural analysis of the three ARMCO huts and Battery C (all designated NHLs), the Power Plant (Building 354) and Cable Station Building 643. The resulting study, Evaluation and Recommendations for Stabilization and Preservation of Six Historic Structures at the Midway Atoll National Wildlife Refuge was prepared by Mason Architects, Inc. (1998), and provided valuable information regarding the appropriate strategies and techniques for stabilizing and preserving these resources. The report was used as a resource when the FWS applied for grants.

The FWS received a *Save America’s Treasures* (SAT) grant for \$308,681 in 1999 to effect repairs on several historic buildings. This ambitious project relied on generous support from Oceanic Society’s Elderhostel volunteers, Midway Phoenix Corporation’s (MPC) contributions for housing and travel costs, contractors who contributed time or materials, and outside donations. Between 2000 and 2004, SAT grant funding assisted with repairing and restoring the Theater windows; preparing condition assessments of the Theater and Cable Station; stabilizing Battery A; and cataloging a library of historic resources and oral interviews. In the second year of the grant the focus shifted to

construction projects. Termite treatment of the Theater, Officer in Charge house, and several shop buildings was accomplished along with re-roofing Cable Building 643. SAT funding also paid for fabricating new front panels for the ARMCO hut and patching the roof of a second Cable Station building.

In addition to the activities noted earlier, Elderhostel volunteers worked at the Cable Station and removed modern interior remodeling, and performed maintenance activities in the cemetery. An interpretive trail that links many of the WWII structures was developed and interpretive signs posted near resources along the path. Removing the fast growing vegetation from around many of the outlying batteries is a yearly task that has usually been accomplished by volunteers and members of Friends of Midway Atoll (FOMA), a non-profit group that supports the Refuge.

A major failure in the initial implementation of the 1999 HPP was the near complete loss of the Cable Station buildings. The Cable Station buildings 628, 619, and 623 were not adequately secured prior to the Navy's 1997 transfer, and the harsh climate and fragile condition of the buildings has set off a chain of events that hastened their deterioration. The buildings lost their structural integrity once holes in the roof allowed water to enter the buildings. Because of the deterioration and safety issues surrounding the three collapsing buildings, the decision was made to "Salvage and Dismantle" them. In 2008, the original windows, doors, and hardware were salvaged from the three buildings and stored in Cable Building 643. However, there still remain hazards such as peeling lead paint, crumbling structural steel, spalling concrete walls, and collapsing verandahs. Cable Building 643 has been "Mothballed," with windows and doors closed and support provided to the verandahs. Additionally, rust inhibiting paint has been used to treat the exposed steel columns and stair railings. But, the condition of Cable Building 643 is still tenuous.

Over the years FWS staff have revisited each of the historic properties, noted changes in condition or treatment, and photographed the resources. The most complete reviews were accomplished in 2004 and 2007 and these have been consolidated into one table (see Appendix A) along with the results of the most recent survey conducted in 2009 to accurately capture the condition of each resource.

1.4 NHPA Compliance 1999-2009

The FWS consulted with the Advisory Council on Historic Preservation (Council), the Hawaii State Historic Preservation Division (SHPD), and interested parties, especially the Historic Hawaii Foundation, in accordance with NHPA on a variety of projects during the past decade (Table 1.1). Projects that required Section 106 review included: rehabilitation of the Officer's housing; repairs to the Theater; repairs to Cable Station 643; SAT grant projects; moving the fuel farm; creating habitat; using the Brackish Water Reservoir (S5247) as a holding tank for hazardous materials, and changing the treatment category of the Cable Station Buildings 628, 619, and 623 from "Secure" to "Salvage and Dismantle."

The first project that has proven to be an adverse effect as per Section 106 of the NHPA was changing of the treatment of the three Cable Station buildings from "Secure" to "Salvage and Dismantle." The loss of an historic property is always distressing, but the integrity of the buildings had deteriorated to the point where rehabilitation was unfeasible. In June 2009, the FWS and SHPO entered into a two-party Memorandum of Agreement (MOA) to mitigate the adverse effects of the undertaking. The FWS is in the process of completing the MOA stipulations.

Table 1.1. NHPA Compliance Log for Midway Atoll NWR.

Date	Project Name	NHPA Compliance	Date Completed	Assigned Staff
1995	Midway PA with Navy	36 CFR 800, Section 106	11/11/1995	Speulda
1996	Midway Annual Report	36 CFR 800, Section 106 and PA	12/23/1996	Speulda
1997	Midway Annual Report	36 CFR 800, Section 106 and PA	8/4/1997	Speulda
1997	Officer's Housing Roof Repair	36 CFR 800, Section 106	5/12/1998	Speulda
1996	Historic Preservation Plan	36 CFR 800, Section 106 and PA	6/8/1999	Speulda, Raymond, Parks
1999	Yearly NHL Report	36 CFR 800, Section 106	9/30/1999	Speulda
2000	Battle of Midway Anniversary	36 CFR 800, Section 110	6/6/2000	Speulda
2001	Memorial Brochure	36 CFR 800, Section 110	5/24/2001	Parks
2002	Battle of Midway 60 th Anniversary	36 CFR 800, Section 110	6/6/2002	Parks, Valentine
2003	Laysan Duck Pond Construction	36 CFR 800, Section 106	2/27/2004	Speulda
1999	SAT Grant Project	36 CFR 800, Section 110	6/1/2004	Speulda
2004	Airport Rx Burn	No Undertaking	10/12/2004	Valentine
2007	Battle of Midway 65 th Anniversary	36 CFR 800, Section 110	6/6/2007	Parks, Speulda
2007	Fuel Farm, FAA Building, rain water reservoir reuse, habitat restoration	36 CFR 800, Section 106	1/30/2008	Speulda
2008	Cable Station change in Treatment	36 CFR 800, Section 106 – Adverse Effect and MOA	4/30/2009 On-going to complete MOA stipulations	Speulda

1.5 HPP-2010 Goals

The HPP-2010 has several overarching goals: to raise awareness of Midway's unique history and sense of place, especially as it is conveyed by the historic properties; to acknowledge the operational needs and funding levels of the refuge; linking this plan with other plans; and to provide a guide for implementing the treatment options recommended in order to meet FWS' responsibility for historic preservation as per NHPA.

The HPP-2010 establishes recommendations and treatment options for individual resources while recognizing that each resource is part of a larger cohesive landscape. Midway's resources are integrally tied to the concept of "reading the landscape," as different areas are associated with historical events or themes. Even with advancing and irreversible deterioration, many of the

structures can still provide a sense of place and tangible association with the World War II-era military facility, the Battle of Midway defensive positions, and the Commercial Pacific Cable Company station. Understanding Midway's historic legacy is fundamental to the development of this document.

The HPP-2010 steps away from the Navy's approach to establish a new path directed by refuge operational needs, safety concerns, funding levels, and historical values. This change in direction is due, in part, to the accelerating deterioration experienced by properties placed in the static "leave-as-is" category. The FWS has recognized that some buildings, if left to deteriorate in place, create unintended safety issues.

Resource management is dynamic, as are changes to resources themselves, both positive and negative. This document serves as a management guide that provides information about each resource and addresses the commonalities among the several plans that affect Midway. Over the past decade, the FWS has redefined its management of the atoll, from accepting the condition of Midway as an abandoned military base to asserting the values of a wildlife refuge. Management decisions have been guided by operational budgets, in-house studies of FWS' infrastructure needs, and inventories of hazardous materials, all while taking on new designations (such as the Battle of Midway Memorial and the Papahānaumokuākea Marine National Monument) and gaining new partners (such as NOAA).

Public outreach and interpretive programs are part of the Visitor Services Plan and Monument Management Plan. Public visitation and partnerships with other agencies will continue to increase, so providing adequate guidelines for the treatment of historic properties is essential for meeting management goals.

1.6 Environmental Impacts on Historic Properties

Natural factors that contribute to the deterioration of historic properties include saltwater, salt spray, salt in soils, precipitation, mechanical and chemical actions of vegetation, solar radiation, and wind erosion. Heavy rain, high winds, and high surf can cause beach erosion, uproot vegetation, tear off roofing, and break windows. Damage caused by storms is unpredictable. Shorelines are also subject to changes. Defensive structures such as pillboxes built on or near the beaches may be affected by wave action, beach erosion and high surf (Figure 4).

Salt in the soil, sea spray, and water is a major element contributing to the deterioration of historic properties. The properties constructed using concrete reinforced with iron or steel bars are particularly susceptible because the concrete mix used beach sand and brackish water. When the steel bars are exposed to salt air a chemical reaction occurs, causing the metal to expand as it corrodes and forcing the concrete to crack. In some cases, entire sides of structures have lost their exterior concrete finish, directly exposing the reinforcing rods to the elements.

Trees, vines, and invasive weeds growing on or near buildings, structures, and features contribute to their deterioration. Roots can stress foundations and walls and the branches and needle litter retain moisture, causing rotting of wood components and providing a home for termites. Smaller plants growing on roofs and in gutters greatly increase the potential for leaks. Seasonal vegetation can hide structures.

Lead Paint

During the past decade, lead paint studies have suggested a close connection between peeling paint and albatross chick mortality when the chicks ingest the chips. While most of Midway's historic buildings are coated with lead-based paint, some of the highest lead readings are found around the Cable Station complex. Because of the risk to wildlife, a program has been initiated to remove or encapsulate lead paint. The Cable Station buildings are closed off to keep birds from nesting near the buildings, but further action has been recommended to remove lead paint from the Cable Station compound, including demolition of four buildings and hand scraping one. Encapsulating lead paint by applying a paint barrier has been successfully used on the Officers' housing and Paint Shop. Lead paint abatement methods can include hand scraping, mechanical removal, and demolition.

Climate Change

Climatic conditions that may affect historic properties are primarily associated with rising sea levels. Currently, a trend in sea-level rise is occurring at a slow pace. Climate models predict that sea levels may rise considerably during this century. According to Church, sea levels have risen about "15cm, and further increases are anticipated in the future due to factors such as thermal expansion and melting glaciers and ice caps" (in Ruddiman 2001). Climate models for the Northwestern Hawaiian Islands (NWHI) predict between 48cm and 129cm (1.5 to 4 ft) of sea level rise between 2006 and 2100 (Baker 2006:10).

A rise in sea level of 48cm or more would affect all shoreline resources including Pillbox S-6 and many of the features on Eastern Island that are currently on the periphery of the beach. Several of Eastern Island's features already affected by shoreline erosion have been displaced onto the beach and are now within the wave zone. The historic remnants on Eastern Island are more at risk from sea level rise because of the potential for shoreline erosion. Most of the historic properties on Sand Island are inland and at a slightly higher elevation. The 2009 condition assessments and treatment recommendations in Chapter 5 specifically identify the properties most susceptible to climate change impacts.



Figure 4. S-6, Pillbox on south beach of Sand Island (2009-10-02:22).

Chapter 2.

Connecting the HPP-2010 to Other Plans and Legal Authorities



Cable Station Building 623, Sand Island (Speulda-Drews, 2007-10-03:295)

2.1 Papahānaumokuākea Marine National Monument Management Plan

The Papahānaumokuākea Marine National Monument Management Plan (MMP) was created following designation of the Monument to “ensure ecological integrity and achieve strong, long-term protection and perpetuation of NWHI ecosystems, Native Hawaiian culture, and heritage resources for current and future generations” (MMP 2008:1). The Historic Resources Action Plan (HR) within the MMP specifically calls for FWS to address the following strategies:

- HR-1: Update the Midway Atoll Historic Preservation Plan to meet the present needs of the Refuge and Monument within one year;
- HR-2: Implement, supervise, and monitor the historic preservation treatments identified in the Midway Atoll Historic Preservation Plan at two historic properties each year;
- HR-3: Prepare an updated Battle of Midway National Historic Landmark nomination within four years;
- HR-4: Improve the function and capacity of the Midway museum within eight years;
- HR-5: Document and inventory historic resources beyond Midway Atoll NWR within 15 years; and
- HR-6: Conduct archaeological and historical research on the historical events and structures at Midway Atoll NWR within 15 years.

The MMP further estimated the annual cost for full implementation of the HR strategies identified. The total estimate was \$22,225,987 over a 15-year period. At this time only \$2.3 million has been allocated for historic resources. These funds were designated for the rehabilitation and reuse of the Officers’ Quarters and provided through the American Recovery and Reinvestment Act (ARRA) of 2009. HPP-2010 meets the strategy for HR-1. Implementing HR-2 through HR-6 is not currently feasible because there are no funds available for historic preservation. Should funding become available, preservation priorities and preferred treatments to accomplish the strategies are presented in Chapter 6.

2.2 Midway Atoll Conceptual Site Plan

A Conceptual Site Plan (Site Plan or CSP) (Jones and Jones 2007) was developed for Midway Atoll following the Monument designation as part of the MMP in order to offer a variety of redevelopment options. While a wide range of design guidelines and principles were identified in the Site Plan, those that are directed toward the protection of historic structures and landscapes include:

- Protect, maintain and interpret historic resources.
- Follow *Secretary of the Interior’s Standards* to protect and maintain buildings that maintain integrity and/or identified as historically significant and eligible for or listed on the National Historic Register,
- Follow *Secretary of the Interior’s Standards* to protect historic landscape features and characteristics,
- Follow National Historic Preservation Act (36 CFR Part 800) regulations to document historic buildings and structures that do not exhibit integrity in anticipation of securing in place (building envelope is sealed) or demolition.

- Salvage materials and leave building footprints or ruins for interpretation that are safe and compatible with wildlife.
- Explore adaptive re-use of historic buildings.

The preferred preservation treatments discussed in Chapter 5 adhere to these guidelines and principles. The Site Plan also added one strategy to those designated in the MMP.

- Document and inventory maritime heritage resources throughout the life of the plan by carrying out coordinated field mapping surveys of selected sites.

2.3 Visitor Services Action Plan

Midway Atoll is the only island within the Papahānaumokuākea Marine National Monument that is capable of offering the general public a “window” into the largest fully protected marine managed area in the world. As such, the MMP accepted Midway Atoll’s interim Visitor Services Action Plan (VSP) (FWS 2006) and affirmed several compatibility determinations allowing certain non-wildlife-dependent activities for the next 15 years. The desired outcome of the VSP is to offer the public opportunities to discover, enjoy, appreciate, protect, and honor the unique natural, cultural, and historic resources of the Monument.

Activities relating to historic preservation identified for furthering this strategy include providing visitors with opportunities to learn about and appreciate the Monument’s cultural and historic resources and to continuously monitor the impacts of visitors and other users on historic resources to ensure their protection. Volunteer efforts supervised by an historic preservation specialist have achieved significant stabilization of historic properties. Presently, interpretive opportunities are limited to self-guided tours of the historic properties and the historic displays located in the refuge office.

2.4 Summary of Principal Cultural Resource Authorities and Legislation

National Historic Preservation Act (NHPA) of 1966, as amended (PL 89-665; 50 STAT 915; 16 USC 470 et seq. 36 CFR 800)

The National Historic Preservation Act requires Federal agencies to consider cultural resources in their plans and activities. Implementing regulations for NHPA are presented in 36 CFR 800, subpart B – the Section 106 Process. “The Section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties” (36 CFR 800.1(a)).

The Advisory Council on Historic Preservation (Council) is the federal agency that oversees NHPA and Section 106 process. NHPA also recognizes the state and local interests in historic preservation by defining a State Historic Preservation Officer (SHPO) to advise and assist federal agencies in carrying out their Section 106 responsibilities. Commonly, federal agencies consult with the SHPO on undertakings that have the potential to affect historic properties. If an undertaking will have an adverse effect, the federal agency is obligated to consult with the Council as well. Midway Atoll is in

a rather unique position because it is a possession of the United States but yet is not included within the political jurisdiction of the State of Hawaii. Thus, the Hawaii SHPO does not have any legal authority at Midway. However, the Council has recommended that the Hawaii SHPO serve as the point of contact for Midway's Section 106 consultation and the Hawaii SHPO has accepted this role.

Case-by-case review of undertakings and consultation with the Council and Hawaii SHPO will continue, in compliance with NHPA, as projects are proposed that have the potential to affect a historic property (refer to Table 1.1).

Antiquities Act, 1906, as amended

This act provides for penalties for damage of antiquities, formation of monuments, and permits for archaeological excavations.

Historic Sites Act, 1935, as amended

This act declares the national policy to preserve historic sites, building, and objects; is the basis for the Historic American Building Survey/Historic American Engineering Records/Historic American Landscapes Survey; and establishes the National Historic Landmarks Program.

Archaeological Resources Protection Act of 1979, as amended

Section 10 – “Each Federal land manager shall establish a program to increase public awareness of the significance of the archaeological resources located on public lands and Indian lands and the need to protect such resources.”

Section 14 - "The Secretaries of the Interior, Agriculture, and Defense shall

(a) develop plans for surveying lands under their control to determine the nature and extent of archaeological resources on those lands;

(b) prepare a schedule for surveying lands that are likely to contain the most scientifically valuable archaeological resources"

National Environmental Policy Act of 1970, as amended

Section 101(b) - “ . . . it is the continuing responsibility of the Federal government to use all practicable means ... to improve and coordinate Federal plans, functions, programs and resources to the end that the Nation may:

(4) preserve important historic, cultural, and natural aspects of our national heritage . . .”

Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation, 1983

Presents standards for preservation planning and professional qualifications for conducting CRM-related work.

Secretary of the Interior's Standards for the Treatment of Historic Properties, 1995

Guidelines for preserving, rehabilitating, restoring, and reconstructing historic properties.

Native American Graves Protection and Repatriation Act, 1990, as amended

This act requires Federal agencies and museums to inventory, determine ownership of, and repatriate certain cultural items and human remains under their control or possession. Federal agencies are required to determine the cultural affiliation of cultural items in their possession or under their control and return those items to the appropriate tribe, Native Hawaiian organization, or individual upon request. The Act's requirements also address the repatriation of human remains

and specified cultural items inadvertently discovered by construction activities on lands managed by the agency.

American Battlefield Protection Act, 1996

Promotes the interpretation and protection of sites where historic battles were fought on American soil during the armed conflicts that shaped the growth and development of the United States, in order that present and future generations may learn and gain inspiration from the ground where Americans made their ultimate sacrifice.

Sunken Military Craft Act

Preserves the right, title, and interest of the United States in and to any United States sunken military craft – (1) shall not be extinguished except by an express divestiture of title by the United States; and (2) shall not be extinguished by the passage of time, regardless of when the sunken military craft sank.

Section 1402 (a) No person shall engage in or attempt to engage in any activity directed at a sunken military craft that disturbs, removes, or injures any sunken military craft, except – (1) as authorized by a permit, etc.

Paleontological Resource Preservation Act, 2009

This act provides for the preservation of paleontological resources, in part through their management and protection on Federal lands using scientific principles and expertise. Permitting for collection is authorized under PRPA. The act also provides law enforcement with tools and authorities for prosecuting fossil theft and paleontological resources damage cases. Federal land managing agencies are directed to establish programs to increase public awareness and develop plans for inventorying, monitoring, and deriving the scientific and educational use of paleontological resources.

Museum Property Program

The Service is responsible for managing archaeological materials removed from Service lands, historical documents and objects, zoological and botanical specimens, and artwork. By definition, museum property is a subset of personal property. However, museum property differs from other types of personal property because it has been acquired according to some rational scheme with the purposes of preserving it for study, interpretation, and other uses. Museum property tends to appreciate in value over time. Museum property also includes items that are associated with important events in United States history.

Fish and Wildlife Service Manual

602 FW 1-3, "Refuge Planning"

614 FW 4. 1 (B), "Cultural Resource Management Plans"

126 FW 1-3, Library and Museum Services

Departmental Manual

411 DM 1-3

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Chapter 3.

Midway's History: A Context for Cultural Resources



ARMCO Hut S6194 (Speulda-Drews, 2009-02-01:012).

3.1 Environmental Setting

Midway Atoll is located in the north-central Pacific Ocean, near the northwest end of the Hawaiian Island chain. The Midway Atoll NWR boundary, as established by Executive Order 13022, lies between the parallels of 28 degrees 5 minutes and 28 degrees 25 minutes North latitude and between the meridians of 177 degrees 10 minutes and 177 degrees 30 minutes West longitude. The atoll's coral reef is five miles in diameter and is defined by a fringing reef that is broken in several areas, allowing access to the lagoon. Eastern and Sand islands, the landforms that comprise the refuge, are approximately 1,250 miles northwest of Honolulu (refer to Figures 1-3).

Eastern Island, the older of the two, is composed of coarse pieces of coral, shells, and gravelly sand. Triangular in shape, it is about 1.25 miles long and .75 miles wide. Sand Island, 1.5 miles long and about .75 miles wide, was essentially formed by fine sand blowing from Eastern Island. A large dune approximately 43 feet high at the northern end of Sand Island is the highest natural elevation on either island.

Midway has a subtropical climate moderated by the trade winds. The average monthly temperature is 72 degrees F, with a mean relative humidity of 76 percent. Fair weather and the northeast trade winds prevail from March through November. Much of the rain comes with the southwesterly winds between December and February. Winter storms and high winds are common. However, Midway is not within the typhoon zone and rarely suffers from extreme weather. Summers are usually warm, fairly dry, and very pleasant.

Native vegetation is limited. Ironwoods (*Casurina equisetifolia*) and weedy species such as golden crown-beard (*Verbesina encelioides*) were introduced at the turn of the century as a means of controlling blowing sand, but are now a troublesome invasive. Native plants such as beach naupaka (*Scaevola serica*), alena (*Boerhavia diffusa*), beach morning glory (*Ipomoea pes-caprae*), and beachgrass (*Eragrostis variabilis*) are being propagated and reintroduced to the islands. Canaries that escaped captivity are among the nonnative bird species present on the atoll. Rats introduced from cargo ships have been eliminated through an aggressive trapping program. Mice and termites, which were also introduced in cargo, continue to be problematic.

Alterations to the natural conditions on Midway Atoll began when the first superintendents of the Commercial Pacific Cable Company imported thousands of tons of top soil from Hawaii, and later Guam, in an effort to establish gardens and trees. The imported soil often blew away in storms, but eventually a small grove of ironwood trees took hold near the Cable Station complex. Ironwood trees that now cover most of the periphery of Sand Island are the progeny of this small grove planted by the Cable Station employees. A program to remove ironwood trees from Eastern Island has returned that island to a more natural appearance. Controlling the spread of ironwood trees on Sand Island is ongoing.

Changes to the physical landscape of both islands reflect the military's requirements for personnel, equipment, and facilities. For instance, during World War II, Eastern Island was developed as an airfield, but the runways were abandoned after the war. Sand Island's physical characteristics have changed dramatically. When the base was being constructed, the harbor area was a sandy beach, but the erection of a seawall before the base was finished obliterated the beach. Dredging the harbor and a channel to Eastern Island created a suitable depth for submarines and supply ships. The size of Sand Island increased in the late-1950s when part of the harbor was filled on the

southeast side for a runway extension. The Navy laid out streets, built housing, and planted grass lawns and exotic tropical plants. Remnants of the Navy's landscaping are still found near the Officers' housing and the OIC house.

3.2 Summary of Midway's History

Midway is most notably associated with U.S. military history. Structures involved in the June 1942 Battle of Midway were recognized for their high level of significance and were designated as National Historic Landmarks (NHL) in 1986. In 1992 and 1994, the Navy conducted cultural resources surveys to identify other buildings, structures, objects, and sites on both Sand and Eastern islands. Based on these studies, 69 buildings and structures were determined to be eligible for listing in the National Register of Historic Places, including the nine previously listed as NHLs. However, six structures were removed during BRAC activities, leaving 63 resources which are encompassed by the 1999 HPP and HPP-2010. Presented below is a summary of Midway's history, which provides a context for linking significant events with historic properties. Materials for this text are derived from the various cultural resources studies, secondary source materials, primary accounts of the Battle of Midway, and oral interviews.

Discovery and Shipwrecks: 1850s to 1903

Legendary accounts that describe journeys by Polynesians/Hawaiians to the small islands north of Niihau suggest the possibility that people visited Midway Atoll. Travelers to the northernmost islands in the Hawaiian chain may have stopped at Midway, but the lack of vegetation, especially coconut palms, probably dissuaded permanent settlement. No evidence of Polynesians/Hawaiians has been discovered during cultural resource surveys of Midway. Test excavations revealed that there is nearly two meters of fill over the natural island deposits on Eastern Island and portions of Sand Island have been mounded or scraped and filled, mixing the deposits (Jimenez and Rosendahl 1994; Hilber, Hastert & Fee 1995).

It is difficult to substantiate who was the first to "discover" the atoll and bring it to the attention of the United States. The first recognized landing on Midway occurred in 1859 when Captain N.C. Brooks sailed from Honolulu in the Hawaiian bark *Gambia* on a sealing and exploring voyage. Captain Brooks named the island grouping "Middlebrook Islands" (Helber, Hastert & Fee 1995; *Paradise of the Pacific* 1928, Yoklavich 1993). However, there is an earlier report of discovery that occurred in 1839 by the vessel *Oscar* under the leadership of Captain Dagget, which may refer to Midway (Ward 1967). By 1869, the name "Midway Islands" was adopted by Congress (U.S. Congress, Senate Committee on Naval Affairs, 1869 in Yoklavich 1993:6).

The atoll's location attracted transpacific commercial traders such as the Pacific Mail Steamship Company. An agent for this company, Captain Burdett in command of the *Milton Badger*, spent at least a month on Midway in 1867 attempting to establish a coal storage depot. During this month long stay, two wooden houses were constructed on Sand Island. In 1869, political pressure by the trading companies led Gideon Welles, Secretary of the Navy, to send Captain Reynolds of the U.S. steamer *Lackawanna* to investigate and take possession of the islands in the name of the United States (Farrell 1931:2; U.S. Congress, Senate Committee on Naval Affairs, 1869 in Yoklavich 1993:7). Captain Reynolds formally took possession of the islands and named the natural harbor Welles Harbor after the Secretary of the Navy. Reynolds conducted a survey of the lagoon and recommended that the harbor be improved as a possible military staging area.

In 1870, the U.S. Congress appropriated a sum of \$50,000 to improve the entrance channel to Sand Island. The U.S.S. *Saginaw* was dispatched to Midway to assist the civilian contractor George W. Townsend from Boston, Massachusetts. The machinery and supplies to blast, dredge, and widen an opening in the reef were unloaded onto Sand Island. The *Saginaw* party probably used the houses set up for the coal depot and may have constructed more buildings on Sand Island during their six-and-a-half-month stay. The project stalled when the underlying solid limestone reef was encountered. The contractors determined that the channel opening would require an additional two to five years and nearly a million dollars. Needless to say, the additional cost caused the project to be cancelled. After the party was picked up on Midway, the *Saginaw* wrecked on Ocean (Kure) Island. After this expedition, interest in using Midway as a harbor lessened considerably (Helber, Hastert & Fee 1995:2.9; Warshauer n.d.:13).

In the late 1880s, two shipwrecks occurred at Midway which gave the atoll a notorious reputation. The *General Seigel* (or *Siegel*), a schooner on a shark-hunting expedition with a crew of eight, wrecked in November 1886. The men found shelter in the redwood cabin abandoned by the *Saginaw* party. Three crewmen died, and one was marooned by the remaining four members who sailed from Midway on June 28, 1887. On February 3, 1888, the *Wandering Minstrel*, under the command of Captain F.D. Walker, was wrecked on the coral reef during a similar quest for sharks. The *Wandering Minstrel's* crew of 40 included Captain Walker's wife and sons. Captain Walker and crew were surprised to find the marooned member of the *General Seigel*, Adolfe Jorgensen, still alive after having survived alone for nine months. The shipwreck survivors primarily inhabited Sand Island and commented on the blinding white sand and lack of vegetation. Eastern Island, initially called Green Island because of the vegetation present on it, was used for a residence when the small community had disagreements. During this time several crewmen died of scurvy and six other members were lost in an attempt to sail a small boat from the atoll. Adolfe Jorgensen and two others managed to sail to the Marshall Islands in October 1888. The Walker family and remaining crew members were finally rescued in April 1889, after spending 14 months stranded on Midway. Stories of these survivors, including murders, mutiny, escapes, buried treasure, and rescue inspired Robert Louis Stevenson's novel *The Wrecker*. After the stories of wrecks and marooned crews were published, interest in Midway once again waned.

Commercial Pacific Cable Company and Pan American Airlines: 1903-1940

At the turn of the century, technological improvements in communication and an optimistic expansion phase in the United States renewed interest in the Pacific Rim. Trade with the Hawaiian Islands, Japan, and China created a need for direct communications. President McKinley initiated the idea for a cable across the Pacific in 1899. Congress, in due fashion, discussed the merits of laying a Pacific cable in each of its sessions between 1899 and 1901 (54th, 55th, and 56th) (57th Congressional Report 1902). There were seven bills on the subject, three in the Senate and four in the House (Commercial Pacific Cable Company pamphlet in 57th Congressional Report 1902:21). The Navy proposed sponsoring a cable, but this required a substantial appropriation and there was no guarantee that a government-sponsored cable would be allowed to operate from China or Japan. Another bill suggested that the government form a partnership with a private company and share the costs (57th Congressional Report 1902).

Documents written at the time reveal that there was a high level of competition among the various telegraph companies. For instance, Western Union disputed the right of the Commercial Pacific Cable Company (CPC) to install the submerged cable, called the project illegal, and asked for a Presidential order to stop the project (Memorandum 1902). Finally, a hearing before the Committee

on Naval Affairs of the Senate resolved the conflicts and allowed the CPCC to proceed (57th Congress, Document No. 141 1902). The resolution resulted from CPCC's offer to install the line and lower rates without any government subsidies.

The CPCC was incorporated under the laws of the State of New York on September 23, 1901. The charter authorized it to lay and operate a submarine cable from California to the Philippine Islands by way of the Hawaiian Islands. The authorized capital stock was \$3,000,000, being the amount necessary for the manufacture and laying of the first section of cable from San Francisco to Honolulu (Commercial Pacific Cable Company pamphlet in 57th Congressional Report 1902:25). The company was formed as a subsidiary of the Commercial Cable Company, which was also associated with the Postal Telegraph Company and the Eastern Extension Telegraph Company of London. Although accused of being a foreign-owned interest, the CPCC was headed by Californian John W. Mackay. Mackay had made his fortune in the silver mines of Virginia City, Nevada. Other officers were George G. Ward, vice-president and general manager; Edward C. Platt, treasurer; and Albert Beck, secretary (Commercial Pacific Cable Company pamphlet in 57th Congressional Report 1902:25).

At the time of the January 1902 hearing, the CPCC was already manufacturing cable and laying the line between San Francisco and Honolulu. The line was completed from Guam to Midway on June 18, 1903. The ships *C.S. Anglia* and *C.S. Colonia* installed the cable between Guam and Midway (Haigh 1978:273). Stations were located at San Francisco, Honolulu, Midway, Guam, and the Philippines. The first round-the-world telegram was issued by President Theodore Roosevelt on July 4, 1903.

The first superintendent of the cable station at Midway was Ben W. Colley, who arrived in April 1903, with a staff and several carpenters, in all about 30 people. Colley's wife arrived in August of 1903. Temporary houses were built while the permanent station buildings were being constructed using reinforced concrete and steel beam supports. The innovative use of concrete for walls and second-story floors was still being debated by architects on the mainland when San Francisco architect Henry Meyers sketched the plans in 1902 for the CPCC's relay stations. The four two-story buildings and one one-story servants' quarters provided an office for the cable operator, a mess hall, quarters for the staff, and a superintendent's quarters (Figure 5). The permanent buildings featured a library and billiard room, were plumbed for water, and were wired for electricity that was supplied by an acetylene generator. An ice-making plant, cold storage house, and windmills were also constructed. The small colony was essentially self-sufficient because supplies were sent only about twice a year. Supplies lost in storms and wrecks made life on the island tenuous for the Cable company employees.

The stark white sand drifting over walkways and into buildings was a concern to Superintendent Colley. He began importing soil from Honolulu to make a garden for growing fresh vegetables. Colley also planted *naupaka* (*scaevola*), grasses, ironwood trees, and coconut palms (Colley n.d.). Farm animals were also brought to Midway to supply the residents. The second cable station superintendent, Mr. Daniel Morrison, continued to import soil and plants during his tenure from 1906 to 1921. Other superintendents stationed on Midway included C. Desnouee from 1922 to 1923, H.W. Burdin in 1923, and Alfred J. Cottrell in 1928. The superintendents of the cable station during the 1930s have not been identified. Luis H. Stroup was the last superintendent on Midway, serving from 1941 to 1952. He transferred from the Guam station just before the Japanese took over that island and remained on Midway until the end of the war, operating the cable for the Navy.

With full-time occupation of Midway and a communication link established with the rest of the world, activities on Midway such as poaching were immediately relayed to the Navy. Disagreements between the Cable Company staff and Japanese feather hunters and poachers led to threats against the safety of the residents. In January 1903, President Theodore Roosevelt placed Midway and environs “under the jurisdiction and control of the Navy Department” by Executive Order 199-A.

In May 1904, a group of 20 Marines arrived to protect the cable staff and albatross from poachers. The marines established a camp “north of the center of Sand Island at an elevation of 13 feet, and at a point 330 yards from the shore, these measurements being taken from the base of the flag-pole at the south end of the company street between the two commissioned officers’ tents” (Owen 1904:1-2). The men dug a well, a cellar, and a latrine. “Excellent drinking water was obtained by digging eight feet in a valley southwest of the camp. The cellar was constructed in the north side of a sand dune situated 55 yards northwest of the camp. The latrine is located 106 yards northeast of the camp, between two sand dunes which almost conceals it” (Owen 1904:2). The marines remained on the island for about four years.



Figure 5. View of Commercial Pacific Cable Company's station on Midway, ca. 1913 (Courtesy of the Hawaii State Archives, Neg. #1993.011).

Supply ships began arriving more regularly to supply the marines along with the Cable Company staff. The increase in traffic also led to more shipwrecks on the hazardous fringing reef during winter storms. The *Julia E. Whalen* was wrecked on October 22-23, 1903, on the north-northwest corner of the reef, losing all of her cargo. This wreck was especially difficult for the cable station employees to watch because the ship was loaded with their provisions including food, mail, and fuel, along with top soil, trees, shrubs, and goats (*Pacific Commercial Advertiser* 1903). The Cable Company immediately sent out two ships to provision Midway, but these ships also found the

stormy weather and reef conditions too dangerous for landing and had to turn back without unloading their supplies. Finally, after six months the *Iroquois* successfully unloaded supplies.

In 1905, the U.S. Lighthouse Service established a lighthouse on the highest point on Sand Island. The fixed, white light was first illuminated on September 22, 1905. The light was set on a 32 foot wooden pole on the highest knob (43 ft) on Sand Island, providing an elevation of about 75 feet, visible to about nine miles at sea. In 1926, a steel tower was constructed for the light because the ironwood trees planted by the Cable Company had grown sufficiently to obscure the beam. At least one lighthouse keeper lived temporarily on the island, but operation of the light was soon transferred to the Cable Company's staff. The light station tower was removed during World War II.

In September 1906, the President of the CPCC and his wife were on an inspection tour of the cable relay stations when their ship *Mongolia* got stuck on the coral reef southeast of the atoll. The ship was heavily loaded with coal and 250 Japanese laborers who were returning to Japan. In order to dislodge the ship, it was necessary to jettison most of the coal and personal items of the Japanese laborers. In December 1906, the *Carrollton* bound from New Castle, Australia to Honolulu with a load of coal also became lodged on the southeast fringing reef. The *Carrollton* was not as lucky as the *Mongolia*; it eventually broke in two and sank, with the anchor embedded in the reef. In 1916, the sloop *Helene* wrecked in Welles Harbor, on the shoals about 100 yards from the cable pier. Most of the shipwrecks occurred during the winter months when strong winds and heavy seas obscured the reef.

Perhaps spurred by the CPCC President's visit in 1906, the schooner *Flaurence Ward* was contracted to make regular supply runs between Honolulu and Midway. Between 1907 and 1923, the supplies steadily improved in their variety and frequency.

In 1908, the marines were removed from Midway after a complaint was filed by the CPCC. The marines were blamed for exploding their ammunition dump and setting off rockets in all directions. The Cable Company employees and marines were pinned down until all the ammunition was expended. No one was hurt, but the event caused a reevaluation of the marines' purpose on the island.

In 1906, a cemetery was established on Midway when James Miller, an Assistant Surgeon in the U.S. Navy, died of appendicitis. The small cemetery plot is on a sandy knoll at the north end of Sand Island and is commonly referred to as the "Doctors' Cemetery" because four of the six individuals buried there were medical doctors. The circumstances around each of the deaths and reason for their burial on Midway are unknown; the only information is on the headstones. In 1909, Navy doctor G. W. Hawkins died and was buried in the cemetery. Hawkins' death occurred after the marines had left the island, so he may have stayed with the Cable Company. In 1910, 18-year-old cable operator Philip Vernon Tinker broke his neck while diving in the lagoon, becoming the third occupant of the cemetery. The fourth was Dr. H. Macauley, who died November 28, 1921. Macauley's death coincides with the Navy's use of the island as a rendezvous location. On February 13, 1922, a seaman with the Cable Ship, *Restorer*, died and was buried at Midway. The seaman, Mark Lambnon, was a Native of the Marshall Islands. The sixth and final individual buried in the cemetery was Dr. B. K. Tullidge. His death in August of 1950 post-dates the closure of the naval base at the end of World War II. Once again it appears that a military doctor may have stayed to provide medical service to the cable station staff. Military personnel who died during the war or

during the military's occupation of Midway were buried at sea or transported back to Honolulu or the mainland for burial.

In 1917, the weather bureau established a station on Midway and trained the cable station employees on how to take wind and barometric observations.

Various scientific expeditions also stopped at Midway in the early decades of the twentieth century. In 1911, two zoology professors from the College of Hawaii and the State University of Iowa recommended placing a warden at Midway to protect the birds from poachers. In 1921, the Navy began using Midway as a rendezvous for naval vessels on their east-west Pacific routes. Investigations by the Army Air Service for using Midway as a landing site recommended the location (Yoklavich 1993:18).

While Midway had served as a relay station for the Pacific Cable and as a stopover for vessels since the beginning of the century, an entirely new venture was proposed in the 1930s. Pan American Airways President Juan Trippe began using islands in the Pacific as refueling stations for air travel. Trippe is credited with relocating Wake Island and pioneering a route across the Pacific using a series of small islands as support bases for the amphibious "flying boats." In 1935, Pan American began construction of a refueling base at Midway. The support facilities consisted of a wooden dock and a mooring barge in the lagoon where the seaplanes landed and discharged cargo and passengers (Yoklavich 1993:19).

Pan American constructed overnight guest facilities, including a hotel with a solar-heated hot water system. The hotel, which was nicknamed the Gooneyville Lodge, was Y-shaped with the lounge and dining room in the center and 20 rooms in each of the two flanking wings (Cohen 1985). With the hotel in place, passengers began arriving on Midway in 1936. Pan American's support buildings also included "a machine shop, refrigerator plant, radio station, radio beacon, offices, and power plant" (Bingham 1938 in Yoklavich 1993:20). The Pan American complex, located southeast of the Cable Station, included about 20 buildings that were described as "neat cottages, workshops, and wooden boardwalks" (Lau 1939:3). Besides the Cable Station and Pan American staff, entomologist F.C. Hadden was stationed at Midway in 1936 to inspect and fumigate the planes and thus prevent damage to the agriculture of Hawaii or Guam (Bryan 1938:30).

Military interest in Midway was also stimulated during the 1930s. In 1935, the 6th Regiment marines were activated at San Diego as the first marine group on the West Coast. Their training culminated in a full fleet force exercise on Midway. The men were bivouacked on Midway for 10 days in June. They had to transport all water, food, and supplies from the ship in 60-ft boats. The USS *Utah* was transformed into a radio control ship and used for target practice with water bombs (Elsmere Sutter, personal communication 1998).

Constructing Naval Base Midway 1939-1942

Military interest in Midway accelerated as World War II started in Europe and war in the Pacific appeared to be inevitable. The 1938 report by Rear Admiral Arthur J. Hepburn noted: "From a strategic point of view, an air base at Midway is considered second in importance only to Pearl Harbor" (U.S. Navy, Bureau of Yards and Docks 1947:Vol. II, 154 in Yoklavich 1993:22). Soon after the Hepburn Report, the Army Corps of Engineers began constructing a harbor and seaplane shelter at Midway Atoll. A new settlement on the south side of the island was built to house the Army Corps workers. This advance crew developed infrastructure facilities on Sand Island,

including a well with distilling equipment, water tanks, a septic tank system, a power generator, and basic buildings such as a mess hall, recreation building, and quarters. The construction work was divided into three main tasks: construction of a breakwater, dredging of a ship channel, and dredging of a seaplane anchorage. Work on these projects was completed in 1940 (Bingham, 1938 in Yoklavich 1993:22).

A worker on Midway in 1939 described three “towns” on the island:

Cable City, Gooneyville and Used, the last an abbreviation for United States Engineering Department. This newest of Midway’s towns was composed of gaunt dark-grey barracks ... machinery and machinery parts . . . tractors, . . . lumber and pipes. Gooneyville was the name assigned to the Pan American Airways settlement. Lau described “Cable City” as the “Sunday Park of Midway” (Lau 1939:3 in Yoklavich 1993:22).

Authorization for the Naval Air Base on Midway was approved by House Resolution 2880 on April 25, 1939. One month later, an appropriation of \$63 million was approved for constructing the Midway base. On July 13, 1939, President Roosevelt issued an Executive Order: “In the interests of national defense, the establishment of Naval aviation bases on Palmyra, Johnston and Midway and at Kodiak and Sitka, Alaska be constructed at the earliest practicable date” (Warshauer n.d.:173).

Between 1939 and 1941, the Pacific Naval Air Base contractors built the various facilities on Midway. At first the focus was on expanding the harbor and developing a seaplane landing basin. Additionally, runways for land-based planes were constructed on Eastern Island (Figure 6). When construction projects were running full speed, there were approximately 1,500 men on Midway. The population boom required men to live in tents (Yoklavich 1993:22-24). Indeed, photographs of Sand Island taken at this time show several temporary barracks and rows of tents near the harbor (Figure 7).

The first large group of marines, consisting of nine officers and 168 enlisted men from the 3rd Defense Battalion, landed on Midway on September 29, 1940, along with two five-inch guns and other supplies. The marines were housed in the Army Corps of Engineers’ barracks. The marines immediately commenced work emplacing guns, building magazines and shelters, and also to unload ships arriving at Midway (Heinl 1948:3-10 in Yoklavich 1993:25).

To provide access to Eastern Island, a small boat channel measuring 1,200 ft by 50 ft by 10 ft was dredged. A mooring berth protected by sheet-piling was also built on Eastern Island. Following the completion of this channel, heavy equipment including bulldozers, road graders, steam rollers, and asphalt and concrete batching plants were moved to Eastern for constructing runways (Warshauer n.d.:198-199). By the end of July 1941, the three-runway airfield on Eastern was operational. Additional facilities completed included two hangars, shop and storage buildings, a mess hall, barracks, a power plant, underground magazines, aviation gasoline storage, and a fresh water distillation plant, as well as, electrical lines and telephone service (Warshauer n.d.:205). These were the first permanent structures on Eastern Island.

In October 1940, the U.S. Army Engineers finally achieved a uniform 20-ft depth in the ship entrance channel to Sand Island, and the Naval supply ship *Sirius* was able to proceed inside the lagoon (Warshauer n.d.:194). The harbor area of Sand Island began to take on its current configuration as sheet piling was driven along the shoreline and dredged material was backfilled

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Figure 6. Aerial photo of Eastern Island, runways under construction, ca. 1941, declassified NND Project 868130 (Courtesy of the San Bruno National Archives, Neg. #114277).

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NND Project 868130



Figure 7. Aerial photo of Sand Island under construction in 1941, declassified, NND Project 868130 (Courtesy of the San Bruno National Archives).

to create a 2,800-ft bulkhead. A large seaplane parking mat was also constructed. Three concrete seaplane ramps provided egress from the lagoon. And, a large, steel-frame seaplane hangar was built (U.S. Navy, Bureau of Yards and Docks 1947 in Yoklavich 1993:24).

The Navy contracted with architect Albert Kahn of Detroit, Michigan, “one of the country’s foremost industrial designers to prepare standardized plans for barracks, mess halls, and hangars for various bases” (Woodbury 1946:76 in Yoklavich 1993:24). Kahn’s firm was prolific. In 1937, it produced 19% of all architect-designed industrial buildings in the United States and from 1940 to 1942 was responsible for over \$200 million dollars in defense construction (Hyde 1996:21). Kahn was well known for his use of steel, reinforced concrete and natural light to create huge buildings with comfortable and functional interior spaces. The Officers’ housing reflects Kahn’s design versatility; the houses are functional and stylish with covered patios, fireplaces, large sliding doors and windows, servants’ quarters, and portal window porch details (Figure 8). Kahn also provided plans for barracks and the theater. The station plan replaced the individual units or “towns” with an overall design to meet the needs of the military and changed the civilian character of Sand Island.



Figure 8. Officer-in-Charge House, designed by Albert Kahn (Speulda-Drews 2009-02-01:165).

In 1941, the Naval Air Station was commissioned and the 3rd Defense Battalion arrived on February 14, 1941. The defensive system consisted of 7-inch .45-caliber seacoast defense guns and 5-inch .51-caliber guns that had served in World War I as deck guns on battleships, but which had

been scrapped in 1924 in accordance with the 1922 Washington Naval Treaty. In order to adapt these large guns to a beach environment, batteries with a central reinforced concrete base and threaded bolts were built at strategic positions on Sand and Eastern Islands. Because of the low profile of the islands, the batteries were built on top of mounded sand. The large guns were positioned to fire armor-piercing ammunition at approaching ships. The single-fire guns were not, however, useful for defending against planes. Therefore, interspersed among the large guns were smaller, 3-inch .50-caliber anti-aircraft machine guns for defense against low-flying aircraft. Because these guns were supported by steel outriggers, concrete bases were not necessary. The 3-inch battery design consisted of a low sand-mound base surrounded by a reinforced concrete wall. Near each of the batteries the marines built ammunition magazines, usually banked in a sand dune and covered in sand to protect them from detection.

To defend against a night attack, six powerful 60-inch portable searchlight units were located at strategic points on the beaches to illuminate targets for the 7-inch and 5-inch guns. These lights were set up along the shoreline, each with its own power supply unit, a large diesel-driven generator mounted in a sandbagged emplacement nearby. To direct these searchlights, there were three SCR-268 standard searchlight control radar sets. A radar set was placed upon the highest point on Sand Island, displacing the lighthouse. As these primitive radar sets did not give the elevation of approaching aircraft, three height finders were built along with four M4 anti-aircraft gun directors (Warshauer n.d.:218).

The 6th Defense Battalion, lead by Lieutenant Colonel Harold D. Shannon, arrived on Midway in August 1941, replacing the 3rd Defense Battalion. A small group of seven officers and 204 enlisted men of the 4th Defense Battalion and three officers and 16 enlisted men of the United States Navy Medical detachment were included with the replacements (Warshauer n.d.:207). The Marine Bombing Squadron 231 (VMSB-231) was the first permanent unit of aircraft to be based at the newly completed airfield on Eastern Island (Warshauer n.d.:219).

Within a two-year period, Midway's character had changed from a remote air stopover facility and civilian business operation to a large military facility with a seaplane base, airfield, and defensive positions.

First Attack, December 7, 1941

The Japanese surprise attack on Pearl Harbor on December 7, 1941, generated apprehension among the marines on Midway who stood ready all day to defend the atoll from attack. Around midnight, under cover of darkness, two Japanese destroyers shelled Sand Island for almost two hours (Hazelwood n.d. in Yoklavich 1993:26). Marines returned fire. The Japanese naval bombardment caused extensive damage to several buildings, including the seaplane hangar and power plant. Four casualties and ten wounded resulted from the shelling of Midway. The most notorious hit was on the Sand Island power plant (Building 354). A round ricocheted off of the adjacent laundry building roof and entered an air vent, damaging this "bomb-proof" building and disrupting the communications center located on the second floor. Lieutenant George H. Cannon was mortally wounded in the shelling, but refused to leave his post until the communications had been repaired. He became the first marine to receive (posthumously) the Medal of Honor in World War II (Heinl 1948:13 in Yoklavich 1993:26).

The attack caused a strategic shift at Midway, from building an operational base to building a defensible outpost. The defenders of Midway learned that Guam and Wake islands had fallen to the

Japanese and, in the days immediately after Pearl Harbor, they felt that they would be the next Japanese target. In late December 1941, most civilian workers were evacuated from the island (U.S. Navy, Bureau of Yards and Docks 1947:Vol. II, 156 in Yoklavich 1993:26).

Battle of Midway, June 4-6, 1942

Events occurring in the Pacific Theater during World War II began to escalate in the 1940s into a full-fledged threat against the United States and her allies. The Japanese captured Wake Island and Guam on their march south toward Australia. The Battle of the Coral Sea in May, 1942, was an important test of the U.S. Naval carrier fleet against the Japanese Imperial Fleet. The Battle ended in a draw, neither side could claim a complete victory. The carrier *USS Yorktown* was badly damaged and the Japanese thought it was sunk. The *Yorktown's* subsequent repair and the pivotal role it played in the Battle of Midway is an amazing story.

The increasingly powerful offensive operation employed by the Japanese in the Pacific caused military strategists to look closely at other potential targets. Midway Atoll was identified as an important location. If Midway fell, the atoll could be used as a supply base for attacks on Hawaii, Alaska, and California. Suspecting that the Japanese were planning an invasion of Midway, Admiral Chester W. Nimitz worked closely with a new code-breaking team, led by Lieutenant Commander Joseph Rochefort. The pieces of intelligence pulled together by the code-breaking team indicated that a major assault was imminent on an unknown target, designated "AF" by the Japanese.

To determine if Midway was "AF" and thus the target, an intelligence trap was proposed. The plan was communicated to Midway over the secure CPCC cable. Midway was ordered to broadcast a bogus radio message indicating that their water distillation plant was broken and that they needed fresh water. Two days after the fake message was transmitted, Rochefort's group decoded a Japanese dispatch which stated that the target "AF was having trouble with its fresh water distillation system" (Cressman et al. 1990:34). With this information in hand, Nimitz began the difficult task of convincing his staff that the code-breakers were correct. There were many who felt the true target was Honolulu and gave the code-breaking results little credence. The Japanese Admiral, Isoroku Yamamoto, was a brilliant war strategist with superior resources at his command. Miscalculating the target of the Imperial Navy would spell disaster for the United States.

Admiral Nimitz inspected Midway on May 2, 1942. The facilities at Midway were still under construction, but after the visit by Nimitz, building efforts were escalated to meet the Admiral's expectations. Admiral Nimitz asked the Marines what they would need to hold the atoll, and then he tried to deliver everything they requested. The month of May was extremely hectic. Nearly every day new personnel arrived, construction progressed at a fast pace, and new equipment was tested.

Pilots from VP-44, which included 22 Consolidated PB5Y-1 seaplanes, were soon busy flying survey patrols. The planes set out early every morning and flew 700 miles on set vectors, looking for enemy ships. Each patrol took nearly 14 hours to complete. Upon return, the men serviced their own planes and caught a few hours sleep before starting the routine over the next day. The seaplane survey patrols were important for locating the enemy.

Midway Naval Air Station went on full alert May 21, 1942. But, on May 22, 1942, an event occurred that shook the general readiness of the operation. "A group of sailors testing the demolition charges on the aviation gasoline tanks accidentally set off the buried explosives because the circuit wires were reversed. Huge flames erupted into the air and everyone in the general vicinity took cover as

coral and steel fragments pelted the area. Fortunately, no one was hurt, but 400,000 gallons of the carefully hoarded fuel supplies went up in flames” (Warshauer n.d.:251). The accident also damaged the distribution system so that all of the planes had to be fueled with hand pumps from barrels, a very time-consuming task. The accident was relayed to Pearl Harbor via the CPCC cable to ensure that the Japanese could not intercept the message.

Midway had received a collection of outdated airplanes after the December 7, 1941 attack, including 21-Brewster F2A-3 Buffalo fighters of the Marine Group VMF-221 and 21-Vought SB2U-3 Vindicator Scout Bombers of the VMSB-241. Nimitz, juggling the sparse resources of the Pacific Theater, sent all the airpower he could find to Midway. On May 26, 1942, the aircraft carrier USS *Kitty Hawk* unloaded additional men of the Marine Air Groups 21 and 45, weapons, and equipment. Also on board were 16-Douglas SBD-2 dive-bombers assigned to Marine Scout Bombing Squadron 241, now under the command of Major Lofton R. Henderson, and seven Grumman F4F-3 Wildcat fighters assigned to Marine Fighter Squadron 221, headed by Major Floyd B. Parks.

On May 29, 1942, a group of 12-PBY patrol planes armed with torpedoes arrived from Pearl Harbor to reinforce the daily air patrols. Also on May 29th, the Army sent aircraft including four Martin B-268 twin-engine bombers that were detached from the 18th Reconnaissance Squadron and the 69th Bomber Squadron. The planes had been modified to carry torpedoes. The last Army plane to arrive that day was a B-17 Boeing four-engine heavy bomber. On May 30th, seven B-17 bombers arrived. Nine more B-17s arrived on May 31, 1942, under the command of Lieutenant Colonel Walter C. Sweeney. Eastern Island was now filled to capacity with planes and crew. The men arriving with Lt. Colonel Sweeney were billeted in tents because all available barrack space was filled.

The air power before the battle included a multi-agency coalition and was the first time in history that units of the Army, Navy, and Marine Corps had operated under a single commander (Warshauer n.d.:269). The final count of 107 planes occupied nearly every inch of Eastern Island and filled the seaplane hangar on Sand Island. Some of the planes stationed on Midway, such as the Brewster Buffalo and Vought Vindicator, were on their way to the scrap heap when they were called into service and sent out to Midway. The planes included:

- Naval Aircraft= 16 PBY-5A amphibious seaplanes and six new Grumman TBF-1 torpedo bombers.
- Marine Aircraft = 17 SB2U-3 dive-bombers, 19 SBD-2 dive-bombers, 21 F2A-3 and seven F4F-3 fighters.
- Army Aircraft = four B-26B medium and 17 B-17 heavy bombers.

Some of the last units to arrive on Midway before the battle were 11 PT boats of Motor Torpedo Squadron One from Pearl Harbor, dispatched from the Hawaiian Sea Frontier Force. The group made the 1,385 mile voyage to Midway as a group under the command of Lieutenant Clinton McKeller, Jr. This was the longest open-water run the Navy PT boats had ever made (Warshauer n.d.:260) (Figure 9).

By June 3rd, the Midway defensive force also included 12 submarines; nine were stationed in a fanlike arc west of the island and three were positioned inside the 150-mile arc like linebackers (Blair 1975:236). Submarines routinely lined up to report activities of passing enemy ships.



Figure 9. PT boat cruising near Midway (photo on file FWS Cultural Resources Office).

First Strike – June 4, 1942

On the morning of June 4, 1942, during their regular patrol, a Navy pilot radioed a contact report of “the main body, approximately 700 miles away, headed northeast” (Cressman et al. 1990:54). This report was immediately relayed to the pilots on Eastern Island who began deployment procedures. Ironically, the report was not accurate; the pilot had actually seen part of the occupation force rather than the attacking force. Yet, in a strange coincidence, the first attack launched by the Japanese was nearing Midway, and the contact report had alerted the Midway forces. Because of the early report, all of the aircraft were ready to launch when the radar on Sand Island began picking up the incoming enemy planes at about 0630.

The first two air groups to launch were eight rambling F2A-3 Brewster Buffalo fighters and five F4F-3 Grumman Wildcats under the command of Major Floyd B. Parks. Major Parks led his men out to intercept the enemy. The second group, with 12 F2A-3 and one F4F-3 fighter under the command of Captain Kirk Armstead, flew slightly to the west of Major Parks’ group (Warshauer n.d.:273).

Meanwhile, six new TBF-1 Grumman Avengers armed with torpedoes flew to attack the enemy aircraft carriers at the location reported. Under the command of Lieutenant Langdon K. Fieberling, the planes carried the newly developed torpedo into combat for the first time (Warshauer n.d.:273-274). Four B-26B Martin Marauder Army medium bombers were also armed with torpedoes and sent to attack the enemy aircraft carriers.

The last aircraft to leave Eastern Island were flown by the marines of VMSB-241. One group was composed of ancient fabric-covered SB2U-3 Vought-Sikorsky Vindicator scout bombers commanded by Major Benjamin W. Norris. These 12 aircraft were to fly to a prearranged location 20 miles east

of Midway to rendezvous with 16 SBD-2 Douglas Dauntless scout bombers under the command of Major Lofton R. Henderson, commander of VMSB-241.

After the excitement of launching about 70 planes in anticipation of an attack, Eastern Island's airfield was eerily quiet. But within minutes, 108 Japanese planes could be seen zooming towards Midway while the 25 defending Marine fighters were trying valiantly to slow their progress. The enemy formation consisted of 36 Nakajima B5N2 high-level bombers each armed with 1,800 lb bombs, 36 Aichi D3A1 dive-bombers each armed with a 500 lb bomb, and a fighter cover of 36 Mitsubishi A6M2 "Zero" fighters (Warshauer n.d.:274-275). The Japanese military strategy was simple--destroy the base at Midway and clear the way for occupation.

As the enemy force approached Midway, flaming airplanes were observed falling out of the sky. Two Nakajima bombers were hit on their first run over the islands and crashed, one on Sand Island and the other in the lagoon. High-elevation bombers and dive-bombers targeted the airfields, seaplane hangar, and large buildings in an effort to hinder the operation of Midway. The anti-aircraft guns and PT boats returned fire but with little success.

The seaplane hangar was hit and set ablaze. The fuel oil tanks 500 yards north of the seaplane hangar were also hit, sending a thick black column of smoke that could be seen for miles (Figure 10). Other facilities on Sand Island destroyed or damaged in the attack included the dispensary building, torpedo shop, administration building, laundry, transportation building, parachute loft, and Battery D, a three-inch battery located on the northwest shore of Sand Island. On Eastern Island, a large crater was blasted in the asphalt of runway number one and the mess hall, kitchen and food storehouse, power plant building, and salt water distillation equipment were hit.

The enemy's superior airplane technology was showcased when a Japanese squadron leader, upon dropping his bomb, descended to about 100 ft in altitude, turned his D2A1 upside down, and flew the length of the runway. The Marines all gaped at this amazing sight, too surprised to fire. Finally, the marines opened fire and the pilot crashed into the lagoon at the end of the runway (Warshauer n.d.:279).

The attack lasted only 17 minutes, but left the installations on both Sand and Eastern islands in shambles. At 7:15 a.m., the all-clear sounded and crews began the process of putting out fires and clearing the wreckage from the runways. Colonel Ira Kimes issued the radio call that all the 5th Division fighters should return to refuel. There were no return messages, as there were no planes remaining of the 5th Division. Finally, the Colonel issued a command that all fighters return and land. Of the 15 F2A-3 Buffalo fighters sent out, 14 were shot down, and only a couple of the seven F4F-3s made it back. Of the Torpedo Squadron 8, only Ensign Albert K. Earnest was able to finally escape the enemy fighters and find his way back to Midway by sighting the black smoke cloud from the burning fuel oil tanks on Sand Island (Warshauer n.d.:286).

The Army Air Force B-26 Midway detachment also fared badly. During their approach to the enemy aircraft carriers, two of the B-26 bombers were shot down and the other two damaged severely. To make matters worse, all of the launched torpedoes had missed their targets. Of the 16 SBD-2 dive-bombers under the command of Major Lofton R. Henderson, a total of six were shot down by Japanese fighters and anti-aircraft fire directly over the enemy fleet, including Henderson's plane. Major Norris' group of old SB2U-3 Brewster dive bombers were the last

Midway Marine detachment to return to Eastern Island. Two were shot down on their return flight and two went down within sight of Midway (Warshauer n.d.:292).



Figure 10. Damage caused by air strikes during Battle of Midway (San Bruno National Archives).

At the end of the day, Midway's troops were demoralized as they realized the extent of the superior equipment and experience of the Japanese Imperial Navy. Nearly all of the fighter planes launched from Eastern Island were shot down or lost during their first encounter with the Japanese forces.

June 5, 1942

The mood on Midway was low on the morning of June 5th. All battle reports showed that the Japanese forces were moving closer and had shredded the U.S. forces. Midway's defensive ground troops were bracing for another assault and expected a surface landing. One report that four heavy cruisers were only 90 miles away caused a wave of despair among the men.

Unbeknownst to the men on Midway, the second part of Admiral Nimitz's defensive plan included support from the carrier fleet. The U.S. aircraft carriers, The USS *Yorktown*, *Enterprise*, and *Hornet* had arrived at their battle position, "Point Luck," before the Japanese submarines were in place between Midway and Pearl Harbor; thus, the Japanese were also unaware that the carriers were close to Midway prior to the Battle.

At sea, 350 miles northeast of Midway, the U.S. carriers *Enterprise* and *Hornet* were within striking distance when the location of the Japanese carriers was reported. Rear Admiral Raymond Spruance, in charge of the two carriers, decided to strike the Japanese carriers and launched an all-out attack of 20 Wildcat fighters, 67 Dauntless dive-bombers, and 29 Devastator torpedo-bombers. An additional six fighters, 17 SBDs, and 12 TBDs were later launched from the *Yorktown* which was under the command of Rear Admiral Frank “Jack” Fletcher (Morison 1963:154).

The first dive-bombers and fighters from the *Hornet* under Lieutenant Commander John C. Waldron missed the main group and were shot down by Japanese Zeros or anti-aircraft fire; only one pilot survived. The torpedo squadron from *Enterprise* came in next and lost ten out of 14; then *Yorktown*’s fighters arrived, but they were also shot down, losing all but four. These three groups had not made a single hit, and the superiority of the Japanese Navy made it seem invincible.

“Then, a few minutes later, with dramatic suddenness, there came a complete reversal of fortune, wrought by the Dauntless dive-bombers, the SBDs, the most successful and beloved by aviators of all our carrier types during the war” (Morison 1963:156). Two squadrons of SBDs from the *Enterprise* dove on the Japanese carriers *Kaga* and *Akagi*. The *Enterprise* planes, arriving so soon after the last torpedo-bombing attack, meant that the Zeros were still close to the water and had no time to climb to get into position for a battle (Morison 1963:156). The group from the *Enterprise* led by Lieutenant Richard Best dove first on the *Akagi*, but they were pushed off that target by the simultaneous attack by the *Hornet* group led by Wade McClusky. Best’s group flew further and successfully assaulted the *Kaga* while McClusky’s pilots hit the *Akagi* (Richard Best, personal communication 1998).

The *Akagi* took a bomb which exploded in the hangar, detonating torpedo storage, then another which exploded amid planes changing their armament on the flight deck..., and the carrier was abandoned and sunk...Four bomb hits on *Kaga* killed everyone on the bridge and set her burning from stem to stern. Abandoned by all but a small damage-control crew, she was racked by an internal explosion that evening, and sank (Morison 1953:156-157).

The successful rally by U.S. pilots continued when 17 SBDs from the *Yorktown* jumped the carrier *Soryu* just as she was turning into the wind to launch planes, and planted three half-ton bombs in the midst of the deck. Within twenty minutes she had to be abandoned. The U.S. submarine *Nautilus*, pumped three torpedoes into her, hitting the gasoline storage area, causing the carrier to sink in two sections.

“At 1024 Japan had been on top; six minutes later, on that bright June morning, three of her big carriers were on their flaming way down” (Morison 1953:157). The Japanese Navy was able to launch an assault from their one undamaged carrier, *Hiryu*, to strike the U.S. carrier fleet. Japanese attack planes found the *Yorktown* and dropped two torpedoes that damaged the vessel, previously weakened in the Coral Sea battle.

The *Enterprise* launched another group of SBDs to find the last of the four Japanese carriers. Lt. Best led this second charge against the *Hiryu*. At 1700 the bombers found the carrier and dropped four hits, which did her in (Richard Best, personal communication 1998; Morison 1963:157). All four carriers that had been involved in the December 7, 1941, attack on Pearl Harbor sank in a single day of combat.

Personnel on Midway were unaware of the U.S. fleet until a squadron of SBD-3 dive bombers from the carrier *Hornet* found they were critically low on fuel and chose to land at Midway. With all of Midway's pilots accounted for, the dive bombers were not well-received. The pilots flew in low and jettisoned their 1,000 lb bombs upon the reef so as not to endanger the ground crew upon landing. This gesture was thought to be an attack, and fire was returned until the men realized that they were U.S. Navy planes.

June 6, 1942

The situation during the night of June 5 was far from clear to the people at Midway, to the carrier force commanders, or, for that matter, to Nimitz or Yamamoto. The Japanese forces had been weakened, but there was still a large landing force that had not been located. With *Yorktown* disabled, the air groups decimated, and no support in sight, Spruance had to calculate the risk to his fleet if he pursued the Japanese force. Consequently, Spruance retired *Enterprise* and *Hornet* to the eastward. It was fortunate that he refused to tempt fate; had he steered westward that evening, he would have run into a heavy concentration of Yamamoto's battleships and cruisers around midnight, forcing a night gunfire battle that he would have surely lost (Morison 1963:161).

The most critical assignment given to Colonel Shannon was the refueling and arming of the various aircraft that landed on Midway. With the fueling system knocked out, all high octane aviation fuel had to be pumped from the storage tanks on Sand Island into 55-gallon drums, then ferried over to Eastern Island, unloaded, and pumped into the planes by hand. This proved to be a challenge for the marines. During the day and night of June 4th, personnel from the Marine Air Group 22, Patrol Squadron 44 (known as Carlson's Raiders), and the army air crews worked to ensure a steady supply of fuel for aircraft. A total of 45,000 gallons of aviation fuel was transferred during that night (Warshauer n.d.:300).

While the men were working all night refueling and repairing planes, a Japanese submarine, I-168, surfaced southeast of Sand Island and began shelling the atoll. At 1:23 a.m., Battery C, a 5-inch two-gun battery located on the northwest shoreline of Sand Island, returned fire. Then Battery D opened fire. Simultaneously, Batteries E and B on the northeast shoreline of Eastern Island opened fire. This skirmish lasted only a few minutes with no hits scored on either side. Submarine I-168 continued east and, on June 6th, it found the crippled *Yorktown* and fired torpedoes to sink her (Blair 1975:239).

Early in the morning of June 6, Japanese naval commander Admiral Yamamoto gave the surprising order for a general retirement of his fleet, even though he still maintained overwhelming gunfire and torpedo superiority. He had lost his entire fast carrier group, with its complement of some 250 planes, most of the pilots, and about 2,200 officers and men. In all its long history, the Japanese Navy had never known defeat (Morison 1963:160). The battle for Midway took a heavy toll on the Japanese Navy and caused a loss of confidence of the command.

When news of sinking of the four carriers and retreat of the Japanese forces was transmitted to Captain Cyril Simard, in charge of shore-based air operations at Midway, a great relief swept over the men. The Navy then turned its attention to finding survivors. The PBYs flew out on rescue missions, checking anything that looked like wreckage or patches of oil. The last American survivors of the Battle of Midway were found on June 21, 1942, after being at sea in their raft for 17 days.

Battle of Midway Summary

Although the Battle of Midway was actually a rather brief encounter, it was a battle filled with heroic moments and incredible luck for the U.S. The defensive ground troops displayed undaunted courage when the odds were stacked against them. Strategic plans and luck prevailed when the U.S. bombers found their targets and all four Japanese aircraft carriers were sunk along with many of their planes. The Japanese strategy was partly based on the element of surprise and an over-confident attitude based on their previous battles. When they were in turn surprised, it took them too long to recover--and the battle was decided. The toll of lives and equipment lost was heavy on both sides. The sudden loss of four carriers, 275 airplanes, and more than 4,000 men at such a pivotal moment was a stunning blow. Japan would not have time to rebuild and train men to fill the void, a fact which set the stage for their defeat in subsequent battles. The importance of the Battle of Midway cannot be overstated, it was truly the “turning point of World War II in the Pacific” (Allen 1950:63 in Yoklavich 1993:29).

Victory at the Battle of Midway also had global implications. “The Battle of Midway marked not only the major turning point in the Pacific War; it was a watershed event for World War II because...in turn, [it] allowed what historian Samuel Eliot Morison called the “two-ocean war” to go forward. The invasion of North Africa, the first stepping stone for Allied landings on the European mainland, was soon thereafter scheduled for November 1942” (Dudley 2003 speech).

“The Navy Department today commemorates nationally only two events each year. One is the Navy’s Birthday, October 13, 1775. The other is the Battle of Midway, on June 4, 1942” (Dudley 2003 speech).

Remainder of World War II: 1942-1945

After the June battle, Midway’s role switched from defense to offense. Repairs to the damaged facilities caused by the battle required civilian contractors to return and make repairs and install equipment such as refrigerators, distillers, power plants, and rebuilding the seaplane hangar (U.S. Navy, Bureau of Yards and Docks 1947:Vol. II, 156 in Yoklavich 1993:30).

In July 1942, the Midway Submarine Advanced Base was formally established. The base was necessary to reduce the time needed for refueling submarines that were active along the Japanese coastline. From July through September 1942, Navy Construction Battalion (CB/SeaBee) groups arrived on Midway to build a submarine base and a Naval Air Station on Sand Island. Between 1943 and 1945, approximately 5,000,000 cubic yards of material was dredged to provide room for the new submarine base and expand Sand Island for an airfield (Warshauer n.d.:10). During the later part of WWII, submarines played an increasingly significant role.

The Naval Operating Base was established in July 1942 to encompass all the activities on Midway Atoll. The base expansion included three runways on Sand Island, one of which was extended in August 1944. The Eastern Island runways continued to handle large planes until the end of the war (Service Information Office 1992 in Yoklavich 1993:30). A marine squadron stationed on Eastern Island built temporary facilities because the battle had destroyed many of the buildings. In September 1942, the Secretary of the Navy, Frank Knox, approved renaming the airfield on Eastern Island “Henderson Field” after Major Lofton R. Henderson, commander of a squadron of dive-bombers who were shot down during the Battle of Midway.

The 5th Naval Construction Battalion, Midway detachment, constructed Sand Island's three new landing strips, revetments for the protection of aircraft on the field, airfield lighting for nighttime operations, and steel-reinforced concrete storage magazines for the safe storage of high explosive munitions. More accommodations for both officers and enlisted men were also constructed, along with mess halls, storage buildings, and other accessory structures (Warshauer n.d.:6).

Midway became a staging area for troops being sent to battles in the Pacific and served as a stationary aircraft carrier for long-range planes bombing Wake Island. Midway was also busy as an advanced training location for pilots and a submarine refuel and repair station.

The Cold War and Pacific Rim Conflicts 1945-1990

Within a year after the Japanese surrender on August 14, 1945, the Navy began demobilizing men from Midway. Naval Operating Base--Midway was no longer needed as a critical link in the defensive chain. On November 23, 1945, the submarine base on Sand Island was decommissioned and placed into a caretaker status. Men were reassigned and much of the equipment was removed or abandoned (Thorp 1960:25 in Yoklavich 1993:30). Military personnel were reduced to less than 300 men and officers responsible for maintaining the base and operating sea and air rescue services (Apple 1979:21 in Yoklavich 1993:30). The "defensive capabilities of the base ended in July 1947 with the departure of the Marine fighter squadron, VHF 322" (Denfeld in Yoklavich et al. 1994:2).

Pan American Airways began to use Midway as a refueling stop again, but the newer planes did not require as many fuel stops, and Midway was phased out of their operations. Pan American discontinued its operations on Midway in 1947, and its air facilities were taken over by the CAA (now FAA). The Commercial Pacific Cable Company's lines to Guam and Guam to Manila were placed back into service after the war, but restoration of the cable to Japan and China was never completed. By 1950 only about 1,000 cable messages a year passed through Midway. The cable relay system was replaced by radio communications which became the standard for transmitting messages (Haigh 1978:274). In 1951, the Federal Communications Commission (FCC) issued an order authorizing permanent discontinuance of all operations of the Commercial Pacific Cable Company's route between San Francisco and Manila (Mary Godwin, correspondence, 1998). As Naval Operating Base--Midway shifted to a peacetime installation, Naval Construction Battalion Detachment #1155 converted quarters into family housing for dependents. On December 30, 1945, the first families arrived on the atoll.

In 1949, drastic cutbacks in naval installations in the Pacific's 14th Naval District were approved. Midway survived the first round of budget cuts, but by 1950 a further reduction was ordered. Because it was no longer considered to be a strategic base, Naval Air Station/Naval Operating Base--Midway was deactivated (Denfeld in Yoklavich et al. 1994:2). The evacuation of all personnel, except the Cable Company staff, occurred between April and mid-June of 1950. Only the Cable Company staff of about a dozen employees was able to return to a self-sufficient level and remain on Sand Island.

After only two months of closure, the Korean conflict necessitated reactivating Midway as a refueling station for ships and aircraft. The atoll was also used as a rest stop for troops. In April 1953, when hostilities in Korea decreased, the Navy once again deactivated the base on Midway. The third reactivation of Midway, in July 1953, occurred in reaction to Soviet bombers flying across the Pacific, sparking the era of "Cold War" hostilities (Denfeld in Yoklavich et al. 1994). To protect the U.S. and keep track of the Soviet planes, construction of the Distant Early Warning Line (DEW

Line) was started in 1953. The "Pacific Barrier" was extended in January 1956 when the Airborne Early Warning Wing Pacific was established and was comprised of three squadrons of "radar constellation" aircraft. This wing and a few Navy Destroyer Escort Radar vessels made up the Pacific Barrier, extending the early warning system to the mid-Pacific. The Barrier became fully operational on July 1, 1958 (U.S. Naval Station Midway Island 1964:n.p.). Later the squadrons were combined to form Airborne Early Warning Barrier Squadron Pacific. By 1964, there were 34 flight crews each with between 15 and 20 men per crew based on Midway.

The purpose of this operation was to provide a radar line from Midway Atoll to Adak Island, Alaska, some 1,300 miles to the north (NAS Barbers Point 1962:12). The Air Defense Command utilized commercial planes adapted with radar equipment to fly the 14-hour missions. The planes were called "Willy Victors." Continuous coverage necessitated a staggered flight schedule with planes leaving Midway every four hours (Raymond Sheen, personal communication 1998). The planes served as contact points along an imaginary fence across the Pacific. The Pacific Barrier operation was the largest and longest-running Cold War defensive mission at Midway, operating until 1965 (Denfeld in Yoklavich et al. 1994:7).

To accommodate this intensive operation, a huge construction program was initiated at Midway. Between 1957 and 1958, the DEW Line support facilities projects included harbor dredging and expansion, Sand Island runway expansion, building a new hangar, housing (family BEQs and BOQs), the Cannon School, a chapel, a galley for 1,000 enlisted men, water and fuel facilities, and recreational facilities. Even the Cable Station buildings were converted into apartments for families.

Although no permanent housing facilities were constructed there and its runways were never reactivated, Eastern Island's flat, open terrain was used as an antenna field for communications and direction finding equipment of the Naval Security Group Activity (NSGA). And, the Army located a contingent of men on Eastern Island to operate their Pacific Scatter Communication System. The scatter system was a 6,500-mile line network linked to Oahu, the Philippines, and other stations in Asia (Denfeld in Yoklavich et al. 1994:7). A Naval Communication Unit was commissioned on January 1, 1963, in support of anti-submarine patrols in the Pacific and base communications needs.

During the Vietnam War, Midway was one of the main aircraft and ship refueling stations. Classified missions such as the Missile Impact Locating System (MILS), designed to identify test missile impact areas within the Pacific, were based on Midway. The atoll also accommodated the storage and assembly of advanced underwater weapons and the Sound Surveillance System (SOSUS/Project Caesar), a secret system installed in 1968. It included miles of undersea cables with hydrophones that picked up the sounds of submarines (Denfeld in Yoklavich et al. 1994:9).

One significant historical event occurred during the Vietnam War. Midway was selected for the June 8, 1969, meeting between President Nguyen Van Thieu of the Republic of Vietnam and U.S. President Richard Nixon. President Thieu, fearful of riots if he came to the United States, asked for a remote and safe location for a meeting--Midway certainly fit the requirements. The base commander's home (OIC Quarters, Building 414) was the site of this momentous meeting (Denfeld in Yoklavich et al. 1994:8-9). It was during this meeting that Nixon announced the "Vietnamization" of the war and a U.S. troop withdrawal of 25,000 men.

Following the Vietnam War, ship and aircraft visits declined and Midway was once again reduced to caretaker status. In 1979, base operations were reduced and all dependents were removed. Late in

1981, a Base Operating Services (BOS) contract was created for Midway which provided for the operation of NAF Midway by civilian contractors, thus reducing military personnel (Denfeld in Yoklavich et al. 1994:11).

In the waning years of the Cold War, Midway was utilized for two new missions: Pony Express and Surge. The Pony Express joint operations were missions to monitor Soviet missile testing in the North Pacific and required 20 aircraft and 500 personnel for periods of up to three months at a time between 1982 and 1989. The Surge missions were anti-submarine patrol operations (Denfeld in Yoklavich et al. 1994:11). Construction for military needs and demolition of abandoned buildings has occurred throughout each decade as the Naval Base adapted to meet new directives.

The military character and mission at Midway changed slightly in 1988 when a National Wildlife Refuge was established as an overlay with the base. Two U.S. Fish and Wildlife personnel were stationed on Sand Island to coordinate the protection of species. Also in the mid-1980s, a National Historic Landmarks study was initiated by the National Park Service (NPS) to identify all important features associated with the “World War II in the Pacific” theme. Nine structures on Midway were identified and designated as NHLs.

Changing Priorities: 1990-1997

In 1993, NAF Midway was identified for closure under the Base Realignment and Closure (BRAC) Act of 1990, P.L. 101-510, as amended. NAF Midway was operationally closed on 1 October 1993. Midway Atoll was officially transferred to the U.S. Fish and Wildlife on 31 October 1996. Final withdrawal of all Navy personnel occurred on June 30, 1997, and as the Secretary of the Navy declared, “we are trading guns for goonies” (Figure 11).



Figure 11. 3-Inch anti-aircraft gun emplacement on Eastern Island (Speulda-Drews 2009-02-01:290).

Prior to the Navy's withdrawal, a massive clean-up effort commenced to remove the antennas, buildings, and structures from Eastern Island along with unnecessary facilities on Sand Island. The scope of the clean-up and demolition efforts required compliance with the NHPA and mandated the identification and evaluation of historic properties prior to the removal of any structures or buildings. Several studies were completed under the BRAC requirements. A thorough investigation of the atoll's historic resources was undertaken and several excellent reports documenting the historic resources were completed. Additionally, because of the potential for historic properties to be adversely effected by the Navy's base closure activities, mitigation of the effects required a Historic American Building Survey (HABS) document for many of the historic properties.

The Navy's BRAC activities reduced the number of post-1945 buildings, including the Cold War-era multi-family housing, creating a landscape that today is actually more similar to the 1941 base plan. For instance, many of the Albert Kahn-designed buildings have survived through the years and continue to be used.

Between 1995 and 1997 the U.S. Navy and FWS negotiated the terms of the property transfer and developed a Programmatic Agreement (PA) for the treatment of historic properties. For instance, the Navy originally wanted to demolish 40 historic buildings and structures. The FWS persuaded the Navy to limit the demolition to just six resources. The PA was enforced during the three years of BRAC activities and required yearly updates to the Advisory Council on Historic Preservation. FWS submitted Annual Reports in 1996 and 1997. The final element of the PA was for the FWS to prepare a Historic Preservation Plan, which was completed in 1999.

FWS Operations at Midway: 1998-2009

One of the first steps taken by the FWS after the transfer was to develop an agreement with a cooperator who could provide air service from Honolulu, continue to maintain the infrastructure, and provide accommodations for visitors. The cooperator, Midway-Phoenix Corporation (MPC) accepted the task and refurbished two 1960s barracks for visitor and employee housing. MPC also constructed the Clipper House restaurant and the Captain Brooks beach pavilion in 1999 to enhance the visitor experience. Additional partners, including the Oceanic Society, as well as dolphin, monk seal, and turtle researchers, and deep sea fishing guides were added to the program. Programs for tourists also included volunteer opportunities to support ongoing research and historic preservation efforts.

On September 13, 2000, Secretary of the Interior, Bruce Babbitt, announced the designation of The Battle of Midway National Memorial, “on the lands and waters of Midway Atoll National Wildlife Refuge, ...so that the heroic courage and sacrifice of those who fought against overwhelming odds to win an incredible victory will never be forgotten.” This is the first National Memorial to be designated on a National Wildlife Refuge.

In 2002, the FWS sponsored two events celebrating the 60th anniversary of the Battle of Midway (BOM). A June 3rd reception at the Hale Koa Hotel in Waikiki brought about 75 veterans, family members, and friends together to remember and honor those who served so valiantly during the Battle. On June 5th, 100 people including veterans and family members along with officials from the Departments of the Interior and the Navy held a formal remembrance ceremony on Midway. In October, the refuge hosted about 1,300 visitors from Princess Cruises’ *Regal Princess* as part of a tour of historic battlefield sites in the Pacific. FWS staff provided on-island support and interpretive materials for the annual anniversary of the BOM events, both on-island and in Honolulu. A commemoration of similar scope was held on-island for the 65th anniversary in 2006.

In 2003, FWS terminated MPCs contract which temporarily halted air service. The lack of air service also caused the volunteer programs to be suspended and all non-FWS personnel were removed from the atoll. Subsequently, the FWS contracted with Chugach Industries, Inc., to operate airport support services, the food service, and maintain the Refuge’s infrastructure. However, the visitor services, volunteer program, and research partnerships have not been fully reinstated.

In 2004, the FWS took a comprehensive look at the infrastructure inherited from the Navy and developed recommendations for a lighter footprint and less costly approach to the facilities needed to meet the requirements of a wildlife refuge. While the 2004 study was never finalized, many of the recommendations were used to down-size the aging infrastructure. One example is the decision to abandon the 1960s galley and revise the restaurant into a food-service facility. Water and electrical systems have also been updated.

On June 15, 2006, President George W. Bush established Papahānaumokuākea Marine National Monument, setting aside 139,793 square miles of federal lands and waters to protect the area’s significant natural, cultural, and historic resources. The monument is managed by the Department of the Interior’s U.S. Fish and Wildlife Service and the Department of Commerce’s National Oceanic and Atmospheric Administration, in close coordination with the State of Hawaii. The FWS continues to engage in lead-paint cleanup efforts, conduct studies for hazardous materials, and revise and downsize the operational footprint on Sand Island.

Chapter 4.

Inventory of Midway's Historic Properties



Theater (259) on Sand Island (Speulda-Drews, 2009-10-02:472)

4.1 Previous Cultural Resource Investigations

A study of Midway's heritage resources was initiated in 1986 by the National Park Service when it conducted a survey of World War II-era properties eligible for designation as a National Historic Landmark (NHL). Nine defensive structures were identified on Sand Island. No resources were identified on Eastern Island for inclusion in the NHL.

Archival research, interviews, field surveys, and an architectural survey of the structures, buildings, and objects located on Sand and Eastern islands were conducted between 1992 and 1994 in order to identify historic properties prior to base closure. In 1994, large-format photography of many of the resources was completed following Historic American Buildings Survey (HABS) standards. Results of these studies provided recommendations for NRHP eligibility. Most of the resources are associated with four themes: colonization, initial years of base construction, the Battle of Midway, and World War II 1942-1945. The results of these investigations are presented in several documents, including *Cultural Resources Overview Survey at Naval Air Facility, Midway Island* (Yoklavich 1993), a *Supplemental Cultural Resources Overview Survey* (Yoklavich et al. 1994), and the *Cultural Resources Management Plan* (Helber Hastert & Fee 1995).

A military historian specializing in Cold War history performed archival research and surveyed resources on Eastern and Sand islands that were constructed after 1945. The historian concluded that none of the Cold War facilities at Midway were eligible for the NRHP because they lacked the exceptional importance necessary for resources less than 50 years old (Yoklavich et al. 1994). An archaeological survey of Sand Island was conducted by Dr. Fred Reinman in 1992 as part of the *Cultural Resources Overview Survey* (Yoklavich 1993). The field investigations consisted of a pedestrian survey of Sand Island augmented by 20 subsurface core samples. The surface inspections and core samples produced no indication of pre-1850 settlement on Sand Island. A literature review of Hawaiian legends was conducted to determine if Midway was included in any travel accounts. While references to distant low-lying islands with abundant birds and turtles were found, no clear tie to Midway was detected (Maly 1994 in Yoklavich et al. 1994:A-1-A-4).

An additional field effort was completed in 1994 by Paul H. Rosendahl, Ph.D., Inc. (PHRI) on both Sand and Eastern islands for the *Supplemental Cultural Resources Overview Survey* (Yoklavich et al. 1994). Survey of Eastern Island included 45 auger cores and two contiguous 1.0 meter by 1.0 meter shovel-test units, along with three auger cores and three 1.0 meter by 2.0 meter shovel-test units excavated on Sand Island (Yoklavich et al. 1994:7). These investigations noted very disturbed deposits, with as much as two meters of fill or redeposited sediment over a thin layer of undisturbed sand, indicating that the low-profile islands were periodically scoured by storms and high winds. Polynesian/Hawaiians may have utilized Midway in their extended travels, but the atoll has experienced such pervasive ground-disturbing activities that finding evidence of their use is unlikely. Investigations for archaeological deposits related to the Cable Station employees have never been conducted.

These studies, along with FWS' 2008 survey results, have identified the aggregate of historic properties that need to be considered for treatment. The properties are presented below in tables organized by thematic associations.

Colonization

The first evidence of permanent habitation on Midway is found in the buildings associated with the Commercial Pacific Cable Company, constructed in 1903 (Table 4.1). San Francisco-based architect Henry H. Meyers designed these unique two-story buildings. The innovative design advanced the use of concrete with an embedded steel frame and steel posts (Figure 12). The four primary two-story buildings are arranged around a courtyard plan with a single-story dwelling just outside the rectangle. The buildings are reminders of technological innovations in communication, colonial expansion, and early steel and concrete architecture.

Table 4.1. List of Midway's Historic Properties: Associated with Colonization Theme.

Bldg. No.	Common Name	Description	Current Treatment
643	Cable Station- Mess Hall	Built in 1903, served as the community building for the Cable Station staff with library, billiards room, dining area.	Mothball. Roof replaced with SAT grant. Stabilization repairs ongoing.
628, 619, 623	Cable Station bldg Complex.	Built in 1903, compound included the Superintendent's residence (628); Cable office and relay station (619); and quarters for staff (623).	Salvage and Dismantle to ruin as per MOA with SHPO (2009)
626	Cable Station bldg	Built in 1903, Servant's residence.	Ruin
	Compound	Buildings form a rectangle with central courtyard.	N/A
	Cistern	Circular, concrete in center of compound.	N/A
	Archaeological potential	Cable Station employees resided at site from 1902 to 1952. Potential is high for archaeological deposits.	N/A



Figure 12. Cable Station Building 643, roof replaced with SAT Grant (Speulda-Drews 2009-10-03:224).

Initial Years of Base Construction

Approximately half of the historic properties inventoried on Midway relate to the period between 1940 and 1942. Construction of Midway Naval Air base began in earnest in 1940 with construction battalions and civilian contract workers. Plans for many of the buildings were developed by the Detroit architectural firm of Albert Kahn, including barracks, Senior Officers' Quarters, Shops, the Motor Pool, the Seaplane Hangar, and the Theater (Table 4.2). The Kahn-designed buildings give Midway a distinctive character.

Battle of Midway

Defensive construction prior to World War II is linked with the batteries, pillboxes, bunkers, and revetments (Table 4.3). Eastern Island was heavily damaged during the Battle and the facilities were not rebuilt, today only concrete remnants and foundations of buildings remain on Eastern Island. The Power Station, hit during the December 7, 1941 attack, stands as a reminder of that pivotal moment when the United States entered World War II.

1942-1945

Between 1942 and 1945, after the Battle of Midway, emphasis shifted to creating a Naval Air Station on Sand Island. A few buildings remain on Sand Island that were constructed during or just after the end of WWII (Table 4.4).

Table 4.2. List of Midway's Historic Properties: Associated with Albert Kahn design.

Bldg. No.	Common Name	Description	Current Treatment
151	Seaplane Hangar	Only half remains of the enormous steel frame, metal clad building that housed seaplanes during WWII. Bombed during Dec. 7 th , 1941, raid and nearly destroyed during Battle.	In use for storage of boats and equip.
414,	OIC, Senior	Wood frame, transite siding, two-story residence designed for tropical weather, with verandahs and enclosed porches and attached servants quarters.	In use. Rehab for continued use.
415, 416, 417, 418, 419, 421, 422, 423, 424	Officers' Quarters	Wood frame, transite siding, two-story residence designed for tropical weather, with verandahs and enclosed porches and attached servants quarters.	In use -- ARRA funded rehab.
356	General Squadron Storehouse	Transportation building – Steel frame with transite and fiberglass siding. Steel frame clerestory windows. Best example of Kahn shop building design.	In use.
363	Torpedo Shop w/parachute tower	Steel frame with transite and fiberglass siding. Steel frame clerestory windows.	In use.
342	Paint and Oil Storehouse	Steel frame with transite and fiberglass siding. Steel frame windows. Only example of small, one-story shop.	In use.
357	Torpedo Shop (Machine shop)	Steel frame with transite and fiberglass siding. Steel frame clerestory windows. Rear portion of building is wood frame and houses 1940s machinery.	Mothball.

Bldg. No.	Common Name	Description	Current Treatment
259	Theater and Offices	Steel frame with transite, wood, and fiberglass siding. Steel frame windows. Wood interior finishing and six large murals.	Secure
578, 579	Barracks	Steel frame with transite and fiberglass siding. Steel frame windows. Altered, but only remaining example of Kahn barrack design.	Mothball.
349	Commissary and Cold Storage	Steel frame with transite and fiberglass siding.	In use.
353	Carpentry Shop	Steel frame with transite and fiberglass siding. Wood frame windows (replaced), several alterations.	Mothball.

Table 4.3. List of Midway's Historic Properties: Associated with WWII and Battle of Midway.

Bldg. No.	Common Name	Description	Current Treatment
S-1	5-inch Gun Battery C - "Charlie" (NHL structure)	Concrete surround with threaded base for gun, twin batteries built on constructed sand hills.	Leave As-is
S-2	3-inch gun Battery D - "Dog" (NHL structure)	Concrete surround with footing for gun base, on fairly level ground.	Leave As-is
S-3	Pillbox (NHL structure) near S7125.	Concrete bunker.	Leave As-is; Navy filled with sand.
S-6	Pillbox, south shore (NHL Structure)	Concrete bunker.	Leave As-is
S6194	ARMCO hut (NHL Structure)	Steel Quonset type bunker for storing ammunition, covered with sand. Steel doors.	Secured. Front panels fabricated and installed with SAT grant funding.
S7124	ARMCO hut (NHL structure)	Steel Quonset type bunker for storing ammunition, covered with sand. Steel doors.	Navy (1997) secured by placing clear plexiglass across front.
S7125	ARMCO hut (NHL structure)	Steel Quonset type bunker for storing ammunition, covered with sand. Steel doors.	Navy (1997) secured by placing white plexiglass across front.
354	Power Station	Massive concrete construction. Machinery and equipment inside.	Secure
6-24, 12-30, 3-21	Eastern Island Runways	Three blacktop runways forming a triangle.	Leave As-is
S-7	Metal Pillboxes, north side on inner harbor	Tank turret from WWI tank set on a culvert tube buried to ground level.	Filled with sand.
E-3	Metal Pillbox, Eastern Island	Tank turret from WWI tank set on a culvert tube buried to ground level.	Filled with sand.
S956	Underground Shelter	Concrete bunker built into sand dune along south beach.	Leave As-is

Bldg. No.	Common Name	Description	Current Treatment
E-6	Revetments	Sand dune bunkers built to protect planes.	Leave As-is
S2115	Seaplane Ramp	Concrete ramp in harbor.	In use.
S9132, S2117	Seaplane Ramps.	Concrete ramps in deteriorating condition on west side of harbor.	Ruin.
E-2 (E-21)	Underground Bunker, east of runway.	Concrete structure, very deteriorated.	Leave As-is.
E-7, E-8	Possible Gun Positions, south shore.	Concrete structures, hastily built, some appear to be just bags of cement stacked that hardened in place.	Leave As-is.
N/A (S-9)	5-inch Gun Battery A - Able	Concrete surround with threaded base for gun, twin batteries built on constructed sand hills.	Needs to be evaluated for NRHP eligibility.
E-10 to E-48	N/A	Concrete bunkers, pads, foundations, and other features.	Need to be evaluated for NRHP eligibility.

Table 4.4. List of Midway's Historic Properties: Associated with Naval Base 1942-1945.

Bldg. No.	Common Name	Description	Current Treatment
361	Electrical Switch Station	Massive concrete construction.	In use.
393	Public Works Storehouse	Wood frame building with transite and wood siding, wood frame windows, metal roof.	In use.
5187	Radar Tower bunker	Massive concrete structure with subterranean office and radio control rooms. Built at highest point on Midway next to radar tower.	Secure
631	Small Radar Building	Concrete structure.	Leave As-is
S2123	Plaque in Midway Memorial	Placed soon after Battle of Midway to commemorate battle. Brass plaque.	Leave As-is
S2409	Two 5-inch Naval guns in Midway Memorial	5 in. guns date to 1916, were salvaged off of WWI battleships and installed in Batteries at Midway.	Leave As-is, Guns stripped and repainted with rust inhibiting paint by Elderhostel group in 1999.
E-1	3-inch Anti-Aircraft Gun	Gun mounted at boat dock on Eastern Island.	Leave As-is, Gun stripped and repainted with rust inhibiting paint by Elderhostel group in 1997-98.
144	Diesel Power Plant and Salt Water Pumping Station	Massive concrete construction. Machinery and equipment inside.	Secure

Bldg. No.	Common Name	Description	Current Treatment
S3126, S3127	Water Reservoirs	Concrete subterranean tanks.	In use.
S5247	Brackish Water Reservoir	Concrete subterranean tanks.	In Use. Adaptive reuse as a hazardous waste holding tank. Completed Sec. 106 compliance.
521	Command Post	Massive concrete structure with offices and control room overlooking air field.	Secure.

Properties that are unrelated to the four primary themes or time periods include a small cemetery and individual memorials (Table 4.5). The small cemetery is an anomaly because all military personnel killed in battle or during duty were either buried at sea or transported back to Pearl Harbor. The dates on the gravestones range from 1906 to 1950. Four of the six headstones are for Naval medical doctors, the other two were employees of the Commercial Pacific Cable Company. The Midway Memorial Mall encompasses several plaques, a large gooney bird statue, and two five-inch guns. The guns were probably used during the Battle, and later moved to this location. The gooney bird statue was constructed in the 1970s. Three Japanese grave markers, near the Midway Memorial Mall, date from 1911 to 1916. The three markers were relocated to their current position in the early 1970s.

Table 4.5. List of Midway's Historic Properties: No thematic association.

Bldg. No.	Common Name	Description	Current Treatment
S-4	Cemetery: Bauer Road	Six burial markers.	Leave As-is, volunteers have cleared vegetation and rebuilt surrounding boundary.
S-5	Three Japanese Memorials	Memorial markers for fishermen who died at sea, date from 1911 to 1916.	Leave As-is.

4.2 National Historic Landmark Properties

The significance of the Battle of Midway (BOM) stems from its pivotal role in the successful outcome of World War II. The combined United States forces halted Japanese expansion in the Pacific. The Japanese military strategists had chosen Midway as the objective for an attack and landing force to give them a key station close to Hawaii. The resulting naval battle was a turning point in the Pacific Theater. Homage was paid to the Battle of Midway in 1986 by designating nine defensive positions on Sand Island a National Historic Landmark. The following description of the properties included in the NHL is derived from *World War II-Era Military Facilities, Midway Islands National Historic Landmark* nomination completed by National Park Service Historian Erwin Thompson (1986):

The first Japanese attack on Midway occurred on December 7, 1941, when destroyers shelled the naval installation. Then, flush with victory after victory in the Pacific and Southeast Asia, Japan prepared in the spring of 1942 to capture the Midway Islands, establish a toehold in the Aleutians, and draw out what was left of the U.S. Pacific Fleet and decisively defeat it. Centered on four aircraft carriers, the Japanese fleet of 162 warships and auxiliaries approached Midway in the first days of June. The Marines and Navy personnel on Midway were aware of Japan's intentions and worked furiously to strengthen the defenses. Admiral Chester W. Nimitz, Commander in Chief Pacific Fleet, ordered his forces, centered on three carriers, to sea to intercept the Japanese. On June 3, Midway's aircraft spotted part of the Japanese fleet approaching Sand and Eastern islands. Before dawn, on June 4, the Japanese launched 108 aircraft which attacked both Sand and Eastern islands, inflicting considerable damage. U.S. planes took to the air from Midway but the Marine scout bombers and fighters suffered greatly. The Japanese, unaware that the American carriers were fast approaching, decided to launch a second attack upon Midway. The American carrier planes struck while the Japanese were still rearming. By the end of the Battle of Midway, all four Japanese carriers had been sunk, while the United States lost carrier *Yorktown*. The Japanese lost 332 of their finest aircraft, and more than 2,000 of their most experienced pilots and sailors perished. The Japanese navy never fully recovered and its expansion in the Pacific had been stopped. American naval power in the Pacific was restored. The morale of the American fighting man leaped upward. The American victory at Midway was the turning point of the Pacific war.

The 1986 NHL boundary encompasses the remains of the defensive positions on Sand Island that were involved in the Battle (refer to Table 4.3). The six magazines, S-7113, S-7119, S-7121, S-7124, S-7125, and S-6194 are listed individually with a square of land centered over each magazine measuring 100 by 100 feet (Figure 13). The magazines have a heavy gauge corrugated metal shell with a concrete floor and are covered with sand. The pillbox (S-3) near magazine S-7125 includes a square of land centered over the pillbox measuring 50 by 50 feet. The concrete pillboxes were located near the batteries and served as shelters for men attached to each of the batteries to defend the island against a land invasion. Battery D's 3-inch gun emplacement (S-2) includes a rectangle of land centered on the emplacement measuring 150 by 225 feet. For the two 5-inch gun emplacements at Battery C (S-1), a square of land centered over each of the emplacements measuring 300 by 300 feet is the property boundary (Thompson 1986). The boundary of the NHL nomination includes the individual features between 28° 11' and 28° 13' North latitude and between 177° 19' and 177° 24' West longitude, and does not exceed one acre.

In 1995, the Navy demolished three of the magazines that were in poor condition, ARMCO huts S-7113, S-7119, and S-7121. There are currently six structures designated as elements of the NHL on Sand Island.



Figure 13. ARMCO hut with replaced front panels and roof repairs (2007-10:023).

4.3 Newly Recorded Resources

Since 1997, the FWS has discovered several more historic resources. Battery A on Sand Island is probably the most important and has been included in this HPP as a potentially contributing property (refer to Table 4.3). Eastern Island was intensively surveyed in 2008 by FWS and NOAA archaeologists. More than 40 new features were recorded with GPS and photographed. The features include concrete slabs, remnant bunkers, and foundations. One exciting find is a second instant pillbox. The newly recorded Eastern Island features need to be evaluated to determine their significance based on NRHP criteria (Refer to Table 4.3).

4.4 Submerged Resources

Several studies of the submerged resources around the atoll have been undertaken in the past decade. In 2002, Dr. Hans Van Tilburg published, *Maritime Cultural Resources Survey, Northwestern Hawaiian Islands* a study prepared for NOAA (Table 4.6). Surveys of the lagoon and near-shore rim of the atoll are being conducted by NOAA using noninvasive equipment and techniques. The resources will be photographed, located with a GPS unit, and their condition assessed. Submerged cultural resources data will be reviewed and evaluated to NRHP criteria, and those that meet the historic property threshold will be attached to the HPP-2010 as an Appendix.

Underwater survey procedures for resources that are associated with the military, such as the Corsair (see table below), will be coordinated with the Naval Historical Center. The Navy maintains custody of any military vessels in the waters surrounding Midway, or in the case of the Battle, of any such vessels nearly 150 miles northeast of the atoll. Navy custody is based on the property clause of the U.S. Constitution, international maritime law, and Articles 95 and 96 of the Law of the Sea Convention. These laws establish that right, title, or ownership of federal property is not lost to the government due to the passage of time. Only by congressional action can government property be declared abandoned.

Table 4.6. List of Midway's Historic Properties: Submerged Cultural Resources.

Resource No.	Common Name	Description	Current Treatment
	General Seigel	1886 wrecked on the reef. Wood hull schooner.	Preserve in situ
	Wandering Minstrel	1888 wrecked on reef near Welles Harbor. Wood hull bark.	Preserve in situ
	Julia E. Whalen	1903 wrecked on reef. Wood hull two-masted schooner.	Preserve in situ
	Carrollton	1906 wrecked on south near channel reef. Wood hull three-masted bark.	Preserve in situ
	Helene	1915 wrecked in harbor. Wood hull sloop.	Preserve in situ
	Unknown	1925 lost near Midway. Wood hull Motor Sampan.	Preserve in situ
	USS Macaw ASR-11	1944 wrecked on reef, was salvaged. Steel hull submarine rescue vessel.	Preserve in situ
	YW	1957 wrecked in entrance to main channel. Steel and concrete hull, water barge.	Preserve in situ
	YG-31	1972 intentionally scuttled. Steel hull garbage lighter.	Preserve in situ
	Landing craft	Unknown wreck date. Steel hull Landing Craft Vehicle Personnel (LCVP), used in WWII.	Preserve in situ
	Nightingale	1983, north of Sand Island. Steel hull fishing vessel.	Preserve in situ
	Corsair aircraft	Sand Island south shore.	Preserve in situ
	Aircraft	During Battle and training exercises several planes were lost in the lagoon and waters surrounding Midway.	Inventory needed to pinpoint locations.

4.5 Museum Property Resources

Artifacts, objects, and materials that are associated with important events are defined as “museum property.” While the objects that remain at Midway are most notably tied to the WWII era, other items such as archaeological collections can be included within this type of resource (Table 4.7). Three objects have been determined eligible to the NRHP (Yoklavich 1993) and contribute to the

overall historic qualities of Midway. Additionally, evaluation of the artwork in the theater and machinery used during WWII may determine that those resources qualify as museum property as well. A complete inventory of museum property resources on Midway has not been completed and development of a scope of collection document is an important first step.

Table 4.7. List of Midway's Historic Properties: Museum Property Resources.

Resource No.	Common Name	Description	Current Treatment
S-8	Torpedo and Bomb	Stored in hangar.	Need to be relocated to secure location.
E-4	Metal Pillbox (turret)	Tank turret, currently in "bone yard"	Needs to be relocated to secure location.
E-5	Submarine Netting	Wood boxes and rope, currently in "bone yard"	Needs to be relocated to secure location.
	Murals in Theater	Art Work: Eight murals painted by Seabee units during WWII.	Attached to walls in theater, but starting to be damaged from water.
	Machine equipment	Metal lathe and other machinery used during WWII are in the Machine Shop (357)	Bolted to concrete floor at rear of building, but termite damage is threatening the structural viability of the building.
	Portion of underwater cable	Portion of the underwater cable installed in 1903 was found.	On display in refuge office.

4.6 Memorials

Midway's dramatic role in World War II and the involvement of the Army, Navy, and Marine Corps in the Battle of Midway generates a variety of groups committed to preserving the site and memorializing the Battle. The men who served on Midway during World War II are extremely interested in the preservation of the island's history, but their ranks are declining as the years go by. The "Defenders of Midway" organization and the Sixth Defense Battalion of the U.S. Marine Corps are two veterans groups with close ties to Midway. Another group interested in Midway is the International Midway Memorial Foundation (IMMF), an organization that advocates for the protection and interpretation of Midway's historic resources, particularly those associated with the Battle of Midway. There are also groups of people who lived or served on Midway throughout the years that have formed associations.

IMMF erected two monuments on Midway in 1996, one on Eastern Island commemorating Henderson Airfield and one on Sand Island depicting the Battle of Midway and listing the U.S. personnel lost in battle (Figure 14). The IMMF supported legislation to designate Midway as a national memorial.



Figure 14. IMMF memorial on Sand Island (Speulda 2000-06-06:20).

Chapter 5.

Treatment Options for Historic Properties



Paint Shop (342) (Speulda-Drews, 2009-02-01:120)

5.1 Introduction to the HPP-2010 Treatment Options

Historic preservation treatment options on Midway fall within five general categories of: In Use, Mothball, Minimal Maintenance, Dismantle and Salvage, and Ruin. Various stages of rehabilitation can be achieved with the In Use and Mothball treatments. The changes in the treatment approach to historic properties recommended in the HPP-2010 are proactive and in-keeping with the *Secretary of the Interior's (SOI) Standards*. Management decisions that will significantly alter the character-defining features of an historic property or that causes a property to decline to a ruin are considered adverse effects that are subject to Section 106 consultation with the council, SHPO, and interested parties to meet NHPA requirements.

The best way to ensure that a building or structure is adequately maintained is to continue using it in some capacity. During the past decade, general operating and deferred maintenance budgets have supplied only limited funding for work on historic properties. In 2009-2010, American Recovery and Reinvestment Act (ARRA) funding was used to rehabilitate and retrofit the Officers' Quarters (400 housing) for energy efficiency. Grant funding such as a National Park Service Technical Assistance Grant and a *Save America's Treasures* grant have also provided support to accomplish several preservation projects.

The category "In Use" is directed toward buildings such as houses and shops that are in daily use and are included in the refuge's operating schedule for maintenance. Yet, "maintenance" does not adequately address the types of structural repairs that are needed for historic resources that are at least 70 years old. Rehabilitation is needed for nearly every building to meet safety issues and address major structural deterioration. Rehabilitating buildings on Midway is also more costly and complicated than at most refuges because of the remote location and added expense of shipping supplies to the atoll.

Many of the WWII structures which are not being reused for operational needs are nevertheless very important for interpretation and public education. Currently, the historic properties that are considered valuable only for their interpretive potential are not included in the refuge's maintenance plan. Therefore, expanding the concept of "In Use" to include interpretive goals is an important consideration for the long-term preservation of many of the structures, such as the batteries and pillboxes. Additional consideration should also be given to developing innovative adaptive reuse opportunities in order to utilize viable historic structures while preserving and interpreting them.

Changes from the 1999 HPP to the HPP-2010

In 1999, 63 historic properties were included in the HPP. The inventory of historical resources has increased in the past decade to include newly discovered features and structures, submerged resources, and the artwork, machinery, and artifacts on Midway that are museum property. Already limited funding will be stretched even further to address this increase in historic resources requiring management. The range of treatment options has also been expanded in the HPP-2010 and the terminology modified to account for issues that have arisen in the past 10 years and to conform to the *SOI Standards* (Table 5.1).

Table 5.1. Treatment Category Changes Between the 1999 HPP and HPP-2010.

1999 HPP	HPP-2010
Reuse	In Use
	Rehabilitate
	Mothball
	Minimal Maintenance
Secure	Mothball
Leave As-Is	Mothball
	Minimal Maintenance
	Salvage and Dismantle
	Ruin
Fill	Fill/Ruin
Relocate	Museum Property

The 1999 HPP did not rank resources or prioritize funding recommendations, making this focus an important new dimension in the HPP-2010. The HPP-2010 update recommends a pragmatic approach. Recognizing that funding levels will never be adequate, prioritizing the needs of historic resources can be used as a tool for justifying expenditures among the competing interests and resources needs on Midway.

In order to develop preservation recommendations, a simple ranking system was designed for Midway's historic properties that summarizes the historic value, reuse potential for refuge operations, and the structural integrity of the resources (Table 5.2).

Reuse changed to In Use, Rehabilitation, Mothball, Minimal Maintenance

In 1999, 25 buildings and structures were recommended for Reuse. In 2010, 21 historic buildings and structures continue to be used. Differences between the 1999 plan and 2010 plan include downgrading the Theater (259), Barracks (578,579), Carpentry Shop (353), and Machine Shop (357) from the Reuse category to a non-use Mothball status (see below). On the other hand, three properties that were slated to be abandoned (Secured) in 1999 are now in use, including the Paint Shop (342), Torpedo Shop (363) and Brackish Water Reservoir (S5247).

To “mothball” a building or structure is a specific treatment that maintains the protective shell or envelope of a building as described in NPS Preservation Briefs #31 “Mothballing Historic Buildings” (Park 1993) and advocated by the *SOI Standards*. On Midway, buildings without adequate protection from water infiltration deteriorate at an exponential rate due to the harsh, wet environment. Structure-specific mothball techniques should be developed for each individual resource but will generally include: maintaining a roof without leaks, covering broken or missing windows, covering missing doors, covering any openings where birds and animals can enter, keeping vegetation away from the walls and roof, and assessing the condition of the mothball treatment on a bi-yearly cycle. Mothball treatments also include removing safety hazards such as spalling concrete, addressing lead paint and hazardous materials issues, and minimizing the causes of deterioration, such as treating wood buildings for termites.

Those buildings that are included in the Reuse category but are not currently being used should be mothballed so that when the building is required for service it has not deteriorated to the point where it is no longer viable to rehabilitate.

The NHL structures and other structures useful for interpreting the Battle of Midway and WWII need to be recognized for their value for public education and outreach by including them in the In Use category. These resources are generally made of concrete, lack utilities, do not have lead paint, and can be maintained with a less aggressive maintenance plan that is generally categorized as Minimal Maintenance. Minimal maintenance is useful for structures where there is no envelope *per se*, but rather, as in the case of the batteries and pillboxes, the structure can be treated by cleaning and patching the concrete, treating the steel with rust inhibitors, and clearing the site of vegetation. All of these activities can be completed with on-island contract labor and volunteers working with a protocol that meets the *SOI Standards*.

Secure changed to Mothball

Eleven resources were recommended to be Secured in 1999. The resources placed in the “secure” category were in many cases not adequately secured prior to the Navy’s transfer and there were no treatment steps outlined. Therefore, the HPP-2010 revises the Secure category and identifies resources that have potential for reuse which should be Mothballed and those resources with little reuse potential but which require Minimal Maintenance to remove safety concerns. The change from Secure to Mothball or Minimal Maintenance recognizes the differences in the types of resources, e.g. buildings that have roofs, windows, and walls that require additional protection as opposed to memorials, guns, and defensive positions that require less intensive maintenance.

Leave As-Is changed to Mothball, Minimal Maintenance, Salvage and Dismantle, Ruin

Twenty-five properties were allowed to deteriorate in place under the Leave As-Is treatment option in the 1999 plan including three resources that were filled with sand. The Leave As-Is treatment was suggested so that structures, such as the massive concrete buildings, could deteriorate in place over the next 50 years or so. However, condition assessments in 2004 and 2007 documented an increasing rate of deterioration for these properties. Based on the 2009 condition assessment, the Leave As-Is treatment is not an adequate approach for Midway’s historic resources, because even the massive concrete structures are deteriorating at an accelerated pace, with the unintended consequence that deterioration and spalling concrete becomes a safety hazard (Figure 15). Therefore, most of the Leave As-Is category properties are now included in the Mothball, Minimal Maintenance, or Salvage and Dismantle to a ruin treatment categories, reflecting the need for at least some level of maintenance to address safety issues.

Salvage and Dismantle is a treatment reserved for properties that have deteriorated to the point that they can no longer be considered for rehabilitation. In some cases the parts of the building may be more important than the building itself. In the case of the Cable Station, for example, the buildings not secured with an adequate roof deteriorated very rapidly. The windows, doors, and some of the hardware were still in good condition and were salvaged to be used to rehabilitate one of the buildings. Dismantling the buildings requires removing the structural components that may cause safety issues such as collapsing roofs, walls, etc. The end result of removing all of the safety issues from the buildings is to reduce them to a stabile state that can be retained and used for interpretation as a ruin.

Several properties listed in the Leave As-Is category have deteriorated to the point that they are considered ruins. Ruins need to be secured so the sites are free from safety hazards to humans or wildlife, so that lead paint and hazardous materials are removed, and so the remnant of the historic property is allowed to contribute to the historic character of the atoll. A ruin may continue conveying its historical association and be considered an historic property until it has completely deteriorated. A parallel can be drawn between allowing a ruin to deteriorate in place with the treatment of submerged resources, whereby the ship wrecked remains will eventually deteriorate to the point that all of the metal is gone, but until then the wreck provides a public interpretation opportunity and research potential.

Objects to be Relocated in 1999 are being reassigned to a Museum Property resource status. Additional museum property resources will also need to be protected and in some cases moved to a more secure location or even off-island. Treatment recommendations for submerged cultural resources that meet the historic property threshold will be attached to the HPP-2010 as a separate Appendix.



Figure 15. Power Plant (354) with spalling concrete (Speulda-Drews 2009-02-01:149).

5.2 Ranking the Historic Properties

The historic property ranking system was developed by reviewing each of the terrestrial historic resources from three points of view: usefulness to refuge operations, structural integrity/current condition, and historical value. In other words, each historic resource was appraised based on its utilitarian role in refuge operations or potential for reuse by partners, whether the building was structurally safe, and how strongly it conveyed an association with one of the important historic themes. Usefulness to FWS operations is defined as meeting a core mission, goal, or need of the refuge. A survey was conducted in 2009 and each historic property was reviewed to determine the previous treatment category, level of maintenance, and current condition. Each property was discussed with FWS representatives from the refuge, engineering, safety, and cultural resources team to define the operational potential of each property. A ranking system was developed to assist FWS in managing resources and prioritize funding. Submerged cultural resources and museum property were not included in the ranking considerations.

Data for each of the historic properties is presented in Appendix A and on a data reference sheet in Appendix B. Each data reference sheet contains historic background-evaluation information, current status, priority ranking, the present use, whether lead paint is an issue, treatment alternatives, the current condition, and HPP-2010 recommendation for treatment. The sheet also includes the 2009 condition with photographs, HABS information where applicable, RPI Asset #, the common name and number, and the UTM coordinates to provide a quick cross-reference for managers that can also be linked with GIS to assist in planning.

Historical Value Ranking (HVR): The historical significance of each property was ranked on a four-point scale. The highest values were given to structures and resources that are unique or that convey a strong association with an important theme. Letters were assigned to each resource: “A” being the highest level of historical significance; “B” for a secondary level of historical significance; “C” indicating objects and structures unassociated with main themes; and “D” identifying properties with compromised integrity.

Refuge Operations Ranking (ROR): The Refuge’s operational or functional priority for each property was assessed on a four-point scale. The functional needs of the refuge for buildings include housing, shops, and storage. A less obvious functional need is that of interpreting the World War II, Battle of Midway Memorial. Numbers were assigned to each resource: “1” indicating the property is beneficial to refuge or partner operations; “2” properties that meet a secondary need for refuge operations; “3” indicates a low priority for meeting operational needs; and “4” indicates little to no reuse potential.

Current Condition (CC): The current condition of each resource was determined by the FWS Cultural Resources Team (CRT) who conducted visual inspections of each resource in 2004, 2007, and 2009 providing comparative data to track changes in the condition. The CRT’s examination focused on obvious factors, such as cracks in concrete, broken windows, or leaking roofs. Inspection by a qualified structural engineer and historic architect has been limited to just a few buildings. The assessment determinations are presented as four simplified condition categories of: Good- no obvious leaks or failures on the exterior; Fair- minor problems with cracking concrete, leaks, broken windows, or lead paint; Poor- severe problems with cracking, spalling concrete, broken or missing windows, major leaks or termites; and Fair to Poor- reflects a building with a portion that is in poor condition and a part that is in fair condition so both descriptors apply.

All of the historic resources identified on Sand and Eastern islands are listed in Table 5.2 which presents the resources sorted by historical value and refuge operations ranking with the historic theme included for reference.

Table 5.2. Midway's Historic Properties: Theme, Current Condition, and Ranking.

Bldg. No.	Common Name	Historic Theme	Current condition (CC)	Historic Value Ranking (HRV)	Refuge Operations Ranking (ROR)
S2115	Seaplane Ramp	1940-1942	Good	A	1
151	Seaplane Hangar	Kahn architecture; 1940-1942	Fair	A	1
414,	OIC, Senior	Kahn architecture; 1940-1942	Good	A	1
415, 416, 417, 418, 419, 421, 422, 423, 424	Officers' Quarters	Kahn architecture; 1940-1942	Good	A	1
356	General Squadron Storehouse	Kahn architecture; 1940-1942	Good	A	1
349	Commissary and Cold Storage	Kahn architecture; 1940-1942	Good	A	1
363	Torpedo Shop w/parachute tower	Kahn architecture 1940-1942	Fair	A	2
342	Paint and Oil Storehouse	Kahn architecture; 1940-1942	Good	A	2
S6194	ARMCO hut	Battle of Midway	Good	A (NHL)	3
357	Torpedo Shop (Machine shop)	Kahn architecture; 1940-1942	Fair to Poor	A	3
259	Theater and Offices	Kahn architecture; 1940-1942	Fair to Poor	A	3
S-1	5-inch Gun Battery C - "Charlie"	Battle of Midway	Fair	A (NHL)	4
S-2	3-inch gun Battery D - "Dog"	Battle of Midway	Fair	A (NHL)	4
S-3	Pillbox near S7125.	Battle of Midway	Poor	A (NHL)	4
S-6	Pillbox, south shore	Battle of Midway	Fair to Poor	A (NHL)	4
S7124	ARMCO hut	Battle of Midway	Poor	A (NHL)	4
S7125	ARMCO hut	Battle of Midway	Poor	A (NHL)	4
643	Cable Station- Mess Hall	Colonization	Fair	A	4
354	Power Plant	Battle of Midway	Poor	A	4
6-24, 12-30, 3-21	Eastern Island Runways	Battle of Midway	Fair to Poor	A	4
S-7	Metal Pillboxes, north side on inner harbor	Battle of Midway	Fair to poor	A	4
E-3	Metal Pillbox, Eastern Island	Battle of Midway	Fair	A	4
S3126, S3127	Water Reservoirs	1942-1945	Good	B	1

Bldg. No.	Common Name	Historic Theme	Current condition (CC)	Historic Value Ranking (HRV)	Refuge Operations Ranking (ROR)
393	Public Works Storehouse	1942-1945	Poor	B	1
S5247	Brackish Water Reservoir	1942-1945	Good	B	1
578, 579	Barracks	Kahn architecture; 1940-1942	Poor	B	4
5187	Radar Tower bunker	1942-1945	Fair to Poor	B	4
631	Small Radar Building	1942-1945	Fair	B	4
S956	Underground Shelter	Battle of Midway	Good	B	4
353	Carpentry Shop	Kahn architecture; 1940-1942	Poor	B	4
361	Electrical Switch Station	1942-1945	Fair	B	4
S2123	Plaque in Midway Memorial	1942-1945	Good	B	4
S2409	Two 5-inch Naval guns in Midway Memorial	1942-1945	Good	B	4
E-6	Revetments	Battle of Midway	Poor	B	4
E-1	3-inch Anti-Aircraft Gun	1942-1945	Poor	B	4
S-4	Cemetery: Bauer Road	No theme	Good	C	4
S-5	Three Japanese Memorials	No theme	Good	C	4
628, 619, 623	Cable Station bldg Complex.	Colonization	Poor	D	4
626	Cable Station bldg	Colonization	Poor	D	4
144	Diesel Power Plant and Salt Water Pumping Station	1942-1945	Poor	D	4
521	Command Post	1942-1945	Fair to Poor	D	4
S9132, S2117	Seaplane Ramps.	1940-1942	Poor	D	4
E-2 (E-21)	Underground Bunker, east of runway	Battle of Midway	Poor	D	4
E-7, E-8	Possible Gun Positions, south shore.	Battle of Midway	Poor	D	4

5.3 Summary of Ranking Priorities and Treatment Recommendations

All of the properties (32) that fall under historical value ranking (HVR) category A should be considered the highest priority for reuse at Midway in some capacity because of their historical significance and functional potential. However, the A-ranked properties include a wide variety of reuse potentials and resource types, therefore, there are three levels of treatment: Rehabilitation, Mothball, and Minimal Maintenance. The level of treatment thus goes from intensive to minimal, reflecting the structural complexity of the resource and providing maximum flexibility for their management.

The 15 resources ranked as having a secondary historical value (HVR-B) are nearly all ranked as ROR priority 4 for their lack of reuse potential, which means that they are unlikely to receive funding for maintenance. Treatment options include mothballing the buildings and minimally maintaining the structures, memorial items, and revetments. Some level of funding is required to address safety and lead paint issues.

The cemetery and Japanese memorials do not have a reuse potential and are not associated with a primary historical theme. These two resources, ranked as HVR-C ROR-4, will be managed through minimal maintenance. In the past decade, the cemetery and memorials have been cared for by volunteers and this level of maintenance appears to be adequate.

Resources that are ranked HVR-D because their deteriorated condition has diminished their historical value include 11 resources, all of which are also ranked as low (ROR-4) for reuse potential. The Minimal Maintenance and Salvage and Dismantle treatments will apply to these resources. And, while they are very low on the priority list for funding, some level of support is required to address safety and lead paint issues.

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Chapter 6.

Implementing the Treatment Recommendations



Theater (259), on Sand Island (Speulda-Drews 2007-10-03:374).

6.1 Recommendations

Over the past decade Midway Atoll NWR has undergone significant changes. The HPP-2010 documents changes that have occurred to historic properties in order to update the treatment recommendations. It is noteworthy that no historic properties have been demolished, removed, or destroyed and that the condition of many properties has substantially improved. Rehabilitation efforts funded with a *Save America's Treasures* (SAT) grant, volunteer-efforts, American Recovery and Reinvestment Act (ARRA) funds, and deferred maintenance funds have repaired and maintained many of Midway's historic resources. The HPP-2010 differs from the 1999 HPP by providing a resource ranking system and establishing priorities for funding. Another difference between the 1999 HPP and HPP-2010 is the refinement of treatment options and integration of historic preservation into the refuge operational needs and other plans (Table 6.1). To meet the goals of the various plans and this HPP-2010, a proactive approach to historic preservation is necessary.

The condition of the 63 properties included in the 1999 HPP was re-assessed in 2009 to identify the needs of the resources for the next decade and to evaluate the successes and failures of the previous plan. The newly identified resources on Sand and Eastern islands will need to be evaluated to the NRHP and added to the list of resources that require treatment. Additionally, the ship wrecks and planes that constitute the submerged resources within the lagoon and fringing reef are currently being studied and management recommendations for each site will be developed with NOAA and the Navy. Guidance from the Sunken Military Craft Act and American Battlefield Protection Act will be followed when developing treatment options for submerged cultural resources.

One of the goals of the HPP-2010 is to create a document that can be used as a tool for resource management. The HPP-2010 is organized in such a way that when new historic resources are discovered the ranking priority system and treatment options can be applied and a treatment developed and included in an Appendix. While all of this documentation can be stored electronically, a hard-copy should be maintained in the FWS office as a reference. A re-evaluation of the HPP is recommended in another 10 years to assess the adequacy of the treatment options and priority rankings.

The HPP-2010 ranks historic properties based on their historic value, their benefit to refuge operations, and their structural integrity. The types of resources also vary and require different types of treatments. Based on the refuge's operational needs, the historic properties that will receive priority maintenance or rehabilitation are the buildings that satisfy a need. This subset of historic properties that have the potential to meet refuge operational needs is currently limited to 21 buildings.

However, interpretation and education are important programs that are linked to the VSP, Site Plan, and MMP. A robust interpretive program that includes the NHL structures as a centerpiece would greatly increase their asset value to the FWS. Resources that fit this expanded definition of properties having a useful purpose would increase the total in the "In Use" category to 41.

Thus, the HPP-2010 recommends focusing more attention and assets on a smaller subset of historic properties, 41 rather than 63, to ensure that the very important resources are treated appropriately even with limited funding. By instituting a priority system for preservation, including a wider range

of treatment options and recognizing the roles of other plans, the HPP-2010 is presenting treatment options that meet the multiple objectives and responsibilities of Midway Atoll NWR.

Museum Properties and Collections

A comprehensive list of Midway's museum properties has not been completed, so the first step to improving management of the museum property at Midway Atoll NWR is to survey and inventory the individual objects and collections, assess their condition; identify their location; and define their provenience, if possible. The information collected during this inventory can be used to develop a scope of collections document. Museum property management may require removing items from the atoll, relocating objects to a secure location, or creating an exhibit with the objects.

A historic preservation specialist is needed to complete museum property inventory and collections documents. However, until an historic preservation specialist joins the staff, the task of managing the museum property is the responsibility of the refuge manager. Training should be provided to the refuge manager regarding the extent of the museum property on Midway and the requirements for managing it effectively.

Memorials

Currently, there is no comprehensive list of the memorials or their locations on Midway. Interested parties may petition the refuge for the right to display a marker, plaque, or symbol. While it is difficult to anticipate every type of request, the following standards will apply to all applicants:

- A compatibility determination (CD) should be conducted prior to the proposed placement of any type of memorial or marker on Midway Atoll NWR
- If determined compatible, memorials and all types of markers must be directly associated with an important historical event or period on Midway;
- Information presented on the marker must be historically accurate;
- A new marker will not duplicate or supersede other markers;
- The scale and materials of the marker should be appropriate and proportional for Midway;
- Signs and markers shall not be attached to historic properties or block the view of a property;
- Signs and markers shall not be a wildlife hazard or intrude on habitat; and
- Marker design and information presented must be reviewed and approved by the Refuge Manager prior to installation.

6.2 Integration of HPP-2010 with Other Plans

Implementing the HPP-2010 will require attention to historic resources by FWS, NOAA, and Papahānaumokuākea Marine National Monument partners. Essentially, this HPP-2010 should dovetail with the station operations and Monument plans, the conceptual site recommendations, and visitor services requirements. However, the needs of the historic resources are complex and require attention in and of their own right. The key to preserving, using, and interpreting Midway's historically significant resources is a sensitive approach to the long-term care of these aging buildings and structures.

Station Operation Plan

There is currently no funding for historic preservation projects *per se*, the only funding available is for maintenance of resources that are being used. Because this is the only funding source, it is important to identify an operational use for Midway's historic properties. Even a building that is not currently being reused but has the potential for reuse should be protected from deterioration, or "Mothballed." Mothballing a building or structure will require funding for resources not currently in use. This is a change in the refuge's operational plan, but is in line with the Monument Management Plan (see below). Some of the Minimal Maintenance efforts can be completed with volunteers. The guiding force in implementing this HPP-2010 is the FWS Project Leader and on-island Refuge Manager. The Refuge Manager is especially critical to the daily decisions that affect historic resources. Because of the incredibly complex issues that connect historic resources with other plans and nearly every other refuge operational and funding decision, each new Refuge Manager should be well versed in the FWS' responsibilities under the National Historic Preservation Act (NHPA) and familiar with this HPP-2010. An on-island historic preservation specialist could advise regarding day-to-day decisions in relation to historic properties, direct volunteer efforts and greatly improve the interpretive potential of many of Midway's NHLs and other structures.

Monument Management Plan (MMP)

The MMP's Historic Resources Action Plan identifies six goals (listed below). The first goal is completed by this HPP-2010.

HR-1: Update the Midway Atoll Historic Preservation Plan to meet the present needs of the Refuge and Monument within one year. This document, HPP-2010, is an update to the original HPP, created in 1999, and is designed to meet the needs of the refuge and the monument.

HR-2: Implement, supervise, and monitor the historic preservation treatments identified in the Midway Atoll Historic Preservation Plan at two historic properties each year. Activities identified for fulfilling this strategy include creating "dedicated capacity to implement the updated Historic Preservation Plan," annually training "Monument staff and the Midway Contractors on the content of the HPP and implementation of appropriate treatments," and incorporating "into the Midway Atoll visitor services program semiannual opportunities and events for visitors or volunteers to implement historic preservation treatments" (MMP 2008: 146). Realization of HR-2 will require funding and a historic preservation specialist. The historic preservation specialist (either contracted or in-house) would advise FWS staff on the preferred methods to perform repairs and maintenance on historic properties in compliance with NHPA. The specialist or FWS Cultural Resources Staff will provide training to refuge staff and managers, volunteers, and contractors. Providing staff training and completing maintenance/repairs on at least two properties yearly would meet the intent of HR-2.

- Taking steps to mothball or minimally maintain a building or structure would meet the goal of treating two properties a year. Providing training courses for refuge staff, volunteers and contractors would also meet the intent of this goal.

HR-3: Prepare an updated Battle of Midway National Historic Landmark nomination within four years. In 1986 the Battle of Midway National Historic Landmark was designated to honor the sacrifices and achievements of those involved. The National Historic Landmark includes the remains of defensive positions directly associated with the battle. In order to accurately and successfully update the NHL documentation, the FWS will contact the NPS-NHL program staff, conduct archival research, complete field surveys and recordation of resources, and consult with interested parties. Funding is necessary to meet this goal.

HR-4: Improve the function and capacity of the Midway museum within eight years.

The FWS has established policies and procedures for Library and Museum Services in the Service Manual, 126 FW 1-3. This guidance establishes responsibilities, standards, and guidelines for preserving and managing Service museum collections consistent with Departmental policies found in 411 DM. The policies address minimum environmental and security standards for storing and exhibiting collections; requirements for documenting the type and use of collections; planning, inventory, and reporting requirements for FWS offices responsible for managing museum property; and FWS-wide data standards and definitions for tracking collections (Part 126 FW 1-3 1997).

Currently, archival materials such as photographs, maps, and battle reports, relating to Midway are scattered across the country in museums, archival institutions, and private collections. Archiving documents on Midway is challenging because of the extreme environmental conditions and difficulty for the public to access the documents. Therefore, the FWS has focused its efforts on acquiring copies of photographs and documents for storage at the refuge office. Because most of the items are copies they are not treated as “museum property,” thus allowing flexibility for storing or exhibiting the materials in less-than-ideal conditions. The difference between accessioned museum property and non-accessioned copies of materials stored on Midway is analogous to a library holding with two categories of books, original or rare books with restricted access maintained in closed stacks and extra copies that are stored on-site and are readily accessible for review.

If items are available for acquisition, objects relating to the Commercial Pacific Cable Company, Pan American Airlines, and the Battle of Midway are the top priorities. Additionally, items associated with personal mementos and recollections from families offer a unique opportunity to explore the individual’s experience on Midway. Especially compelling are the memories, either recorded in oral interviews or as written recollections, of people who were stationed on Midway as children. However, if rare or fragile items are donated to the FWS, their permanent, secure storage will be arranged at an appropriate and qualified repository.

Although not specifically documented in the 1999 HPP, eight large oil paintings completed in 1944 are hanging in the Theater. The theater roof is leaking and the paintings are starting to show evidence of water damage. Action needs to be taken to preserve these unique paintings. Machinery used during WWII, such as the metal lathes in the Machine Shop, need to be inventoried and relocated before the building collapses.

Ideally, an off-island repository would be established in accordance with U.S. Department of Interior Manual 411 DM (1997).

HR-5: Document and inventory historic resources beyond Midway Atoll NWR within 15 years. Studying and protecting historic resources beyond Midway Atoll begins with basic documentary research and site surveys. These activities are similar to those involved with ecosystem research. Both involve consolidation of past research and archival data, and field inventory of non-marine areas within the Monument. Historic resource surveys are compatible with planned multitasking missions, interagency cooperation, and operational efficiency.

Evaluating the newly identified structures and features on Sand and Eastern islands would be in-keeping with the intent of this goal. Survey and identification of historic resources on the other

islands within the Monument is outside of the scope of this HHP-2010, but would provide valuable contextual information to the historic resources on Midway.

HR-6: Conduct archaeological and historical research on the historical events and structures at Midway Atoll NWR within 15 years. The MMP discusses the lack of “nontraditional perspectives and sources of information” thus far obtained regarding Midway. To expand this knowledge base, a regular program to collect and publish oral histories is suggested as well as archaeological research and excavation in the Commercial Pacific Cable Station compound.

Transcribing and publishing oral interviews, providing access to the audio tapes, and continuing to research and refine the historic record of Midway would meet the intent of this goal. Conducting archaeological investigations at the Cable Station compound in order to recover evidence of the first permanent inhabitants is also an important activity under Goal 6.

Conceptual Site Plan (CSP or Site Plan)

The Midway Atoll NWR Conceptual Site Plan was drafted to provide long-term management strategies that consider the important characteristics of each of the major programs. Historic preservation is one program that was included in the CSP. Seven strategies were defined as important for preserving the historic character of Sand and Eastern islands and include:

1. Protect, maintain and interpret historic resources;
2. Follow *Secretary of Interior’s Standards* to protect and maintain NR-eligible properties;
3. Follow *Secretary of Interior’s Standards* to protect and maintain NR-eligible landscape features;
4. Follow NHPA in the treatment of historic properties;
5. Salvage materials and leave footprints or ruins for interpretation that are safe and compatible with wildlife;
6. Explore adaptive reuse of historic buildings; and
7. Document and inventory maritime heritage resources.

The seven recommendations in the CSP mirror the MMP goals and support the treatment recommendations in the HPP-2010. The CSP recognizes the importance of maintaining Midway’s historic properties according to the *SOI Standards* and that reusing buildings is good not only for their preservation, but is also a “green” solution for reducing our carbon footprint on Midway. The CSP also honors the power of place by recognizing that the tangible remnants of past human activity possess inherent cultural value and that ruins can be used for interpretation.

Visitor Services Action Plan (VSP)

The VSP primarily discusses the logistics of transporting, housing, feeding, and providing recreational opportunities for visitors at Midway. Within this set of variables there are opportunities for historic preservation. Housing and recreational facilities for the visitors may be accomplished by using historic buildings. The VSP also appreciates that interpreting WWII, the Battle of Midway, and Cable Station histories is important for providing the public with a quality experience. The unique visitor experience at Midway is clearly tied to the tangible remains of one of the most important battles of the twentieth century and the fascinating story of the Cable Station colony.

The VSP implicitly supports the HPP-2010’s recommendations for preserving the WWII features and Cable Station, as well as the buildings useful for refuge operations in order to provide as many opportunities as possible for enhancing the public’s immersion in the atoll’s unique resources.

6.3 Implementing the HPP-2010 Recommendations

Combining historic preservation with the operational goals and needs of the refuge as defined in the Conceptual Site Plan along with the needs of the Papahānaumokuākea Marine National Monument, the Battle of Midway Memorial, and Visitor Services Action Plan is complex. But, by weaving historic preservation into the daily operations and engaging the various partners in the program, much more will be achieved than simply maintaining the buildings and structures. Participating partners will enhance public education programs which will ensure that the historic legacy at Midway is honored and passed on to new generations.

A useful tool for coordinating the various plans, partners, and preservation treatments is to conduct condition assessments of each historic property on a regular cycle. The information gathered for the condition assessment can be linked to a GIS database to provide updated information to managers regarding each historic resource. The condition and treatment updates will also be appended to the HPP-2010 as an Appendix. The updated information can be captured in a data sheet which provides a quick reference for managers regarding the priority status and treatment of each historic property. Additionally, a priority list for maintenance, repairs, and rehabilitation can be generated to meet deferred maintenance requirements. The yearly update will serve to comprehensively document preservation efforts and changes to historic properties. Oversight will be necessary to track the completion of tasks that have deadlines and meet the intent of the goals stipulated in the various plans. The list of tasks below and Table 6.1 provide quick references for some of the major issues that need to be addressed and accomplished to ensure that the intent of the various plans and partners are fully recognized.

Tasks

- Fund an on-island historic preservation specialist to provide training and supervise FWS staff, volunteers, and contractors to complete historic preservation projects;
- Schedule at least one visit to Midway by a Historic Preservation Specialist to coincide with the construction window to review the condition of historic properties and work with on-island contractor and volunteers to maintain historic resources;
- Increase the volunteer capacity on-island by at least one volunteer dedicated to historic preservation activities to work under the supervision of a historic preservation specialist;
- Require every refuge manager assigned to Midway to attend a training course on NHPA and specifically review the terms and conditions of this HPP-2010;
- Require on-island contractors, Monument managers, NOAA, potential permittees, and other partners to attend a training course on NHPA prior to working at Midway and/or specifically to review the terms and conditions of this HPP-2010 as appropriate;
- Draft a protocol for each building that raises awareness regarding facilities management and repair work that affects the character-defining features of the historic properties, to ensure compliance with Section 106 of the NHPA and reduce the chance for insensitive actions;
- Provide the on-island contractor and refuge manager with the protocols and contact numbers to CRT so that the notification process is clear;
- Review the Battle of Midway National Historic Landmark designation by 2014;
- Prepare yearly reports on the NHL properties for the NPS;
- Survey and document the memorials and their locations on Midway;

- Complete an inventory of museum property resources on Midway and develop a scope of collections document;
- Evaluate historic resources identified on Sand and Eastern islands to determine their significance based on National Register of Historic Places criteria at a rate of two per year;
- Provide some level of maintenance to two historic properties per year;
- Update resource data sheets on a regular, basis with a condition assessment survey that includes photography and reviewing treatment options;
- Maintain a copy of the updated HPP-2010 data sheets in the FWS' office as a hard copy and electronic copy for reference with a backup copy in the FWS CRT, Region 1 office;
- Develop a GIS layer for historic resources on Midway with a link to the data sheets and protocol details to be available for the facilities manager and refuge manager;
- Develop a program to locate, inventory, and make copies of original documents that enhance the interpretation of Midway's history;
- Work with NOAA and the Navy to identify and evaluate submerged cultural resources and develop treatment recommendations; and
- Assess the effectiveness of the HPP in 10 years and update the document as needed.

Table 6.1. Midway's Historic Properties with Treatment Recommendations and Ranking.

Bldg. No.	Common Name	HPP 2010 Recommended Treatments	MMP Goals ¹	CSP Goals ²	Refuge Operations and Historic Value Ranking
S2115	Seaplane Ramp	In use. Rehab for continued use; affected by sea level rise.	2	1,2,3,4,6	1,A
151	Seaplane Hangar	In use for storage of boats and equip. Stabilize so that building can continue to be used for large equip and boat storage.	2,3	1,2,3,4,6	1,A
414	OIC, Senior	In use. Rehab for continued use for housing and Midway House museum.	2	1,2,3,4,6	1,A
415, 416, 417, 418, 419, 421, 422, 423, 424	Officers' Quarters	In use -- ARRA funded rehab. Continue to use for housing.	2	1,2,3,4,6	1,A
356	General Squadron Storehouse	In use. Rehab for continued use for vehicle maintenance shop, bike shop, construction materials, and carpentry shop. Lead paint issues.	2	1,2,3,4,6	1,A
363	Torpedo Shop w/parachute tower	In use. Lead paint issues. Rehab. for adaptive reuse such as an office/shop.	2	1,2,3,4,6	2,A
342	Paint and Oil Storehouse	In use. Continue to use. Lead paint encapsulated.	2	1,2,3,4,6	2,A

Bldg. No.	Common Name	HPP 2010 Recommended Treatments	MMP Goals ¹	CSP Goals ²	Refuge Operations and Historic Value Ranking
S5247	Brackish Water Reservoir	In Use. Adaptive reuse as a hazardous waste holding tank. Completed Sec. 106 compliance.	2	1,2,4,6	1,B
349	Commissary and Cold Storage	In use. Continue to use and maintain. Lead paint encapsulated.	2	1,2,3,4,6	1,B
S3126, S3127	Water Reservoirs	In use. Continue to use and maintain.	2	1,2,4,6	1,B
361	Electrical Switch Station	In use. Maintain for continued use. Lead paint issues.	2	1,2,4,6	4,B
393	Public Works Storehouse	In use. Lead paint issues. Or, dismantle and replace with new structure on concrete pad.	2	1,2,3,4,6	1,B
S6194	ARMCO hut (NHL Structure)	Mothball. Rehabilitated and maintain for interp.	2,3	1,2,3,4	3,A (NHL)
357	Torpedo Shop (Machine shop)	Mothball. Dismantle rear portion. Save front portion and rehab for adaptive reuse. Repair damage from lead paint abatement treatment. Museum property machinery. Or, salvage and dismantle	2,4	1,2,3,4,5,6	3,A
259	Theater and Offices	Mothball -Theater and offices. 1-story shop wing in use. Rehab for use as theater/offices. Lead paint issues. If no rehab possible then salvage and dismantle windows. Museum property art work.	2,4	1,2,3,4,6	3,A
S-1	5-inch Gun Battery C - "Charlie" (NHL structure)	Minimal maintenance or rehab. for interpretation.	2,3	1,2,3,4,5	4,A (NHL)
S-2	3-inch gun Battery D -"Dog" (NHL structure)	Minimal maintenance or rehab. for interpretation.	2,3	1,2,3,4,5	4,A (NHL)
S-3	Pillbox (NHL structure) near S7125.	Minimal maintenance or rehab for interpretation.	2,3	1,2,3,4,5	4,A (NHL)
S-6	Pillbox, south shore (NHL Structure)	Minimal maintenance. Or, rehab. and move higher on beach; affected by sea level rise.	2,3	1,2,3,4,5	4,A (NHL)
S7124	ARMCO hut (NHL structure)	Mothball or rehab. for interpretation.	2,3	1,2,3,4,5	4,A (NHL)

Bldg. No.	Common Name	HPP 2010 Recommended Treatments	MMP Goals ¹	CSP Goals ²	Refuge Operations and Historic Value Ranking
S7125	ARMCO hut (NHL structure)	Mothball. Appears to be no longer viable to restore. Allow to deteriorate to ruin.	2,3	1,2,3,4,5	4,A (NHL)
643	Cable Station- Mess Hall	Mothball. Rehab. for interpretive/adaptive reuse.	2,6	1,2,3,4,6	4,A
N/A (S-9)	5-inch Gun Battery A - Able	Minimal maintenance. Or, rehab for interpretation. Evaluate for NHL designation.	2,3	1,2,3,4,5	Undetermined
6-24, 12-30, 3-21	Eastern Island Runways	Ruin or Minimal Maintenance	2,3	1,2,3,4,5	4,A
S-7	Metal Pillboxes, north side on inner harbor	Minimal Maintenance	2,3	1,2,3,4,5	4,A
578, 579	Barracks	Mothball. Or, salvage windows, etc. and dismantle.	2	1,2,3,4,5	4,A
E-3	Metal Pillbox, Eastern Island	Minimal Maintenance	2,3	1,2,3,4,5	4,A
5187	Radar Tower bunker	Mothball	2	1,2,3,4,5	4,B
631	Small Radar Building	Mothball	2	1,2,3,4,5	4,B
S956	Underground Shelter	Mothball or Rehab. for interpretation.	2,3	1,2,3,4,5	4,B
353	Carpentry Shop	Mothball. Or, salvage and dismantle.	2	1,2,3,4,5	4,B
S2123	Plaque in Midway Memorial	Minimal maintenance and increase interp. Or relocate.	2,4	1,2,3,4	4,B
S2409	Two 5-inch Naval guns in Midway Memorial	Minimal maintenance and increase interp.	2,4	1,2,3,4	4,B
E-6	Revetments	Ruin or Minimal Maintenance	2,3	1,2,3,4,5	4,B
E-1	3-inch Anti-Aircraft Gun	Minimal Maintenance	2	1,2,3,4	4,B
S-4	Cemetery: Bauer Road	Minimal Maintenance and interpretation.	2	1,2,3,4	4,C
S-5	Three Japanese Memorials	Minimal Maintenance and interpretation.	2	1,2,3,4	4,C
628, 619, 623	Cable Station bldg Complex.	Ruin -- Salvage and Dismantle as per MOA with SHPO; leave concrete core and pad; remove lead paint.	2,6	1,2,3,4,5	4,D

Bldg. No.	Common Name	HPP 2010 Recommended Treatments	MMP Goals ¹	CSP Goals ²	Refuge Operations and Historic Value Ranking
626	Cable Station bldg	Ruin—dismantle roof, remove lead paint; leave concrete core and pad.	2,6	1,2,3,4,5	4,D
144	Diesel Power Plant and Salt Water Pumping Station	Ruin -- Minimal maintenance to remove safety issues.	2	1,2,3,4,5	4,D
354	Power Plant	Ruin -- Minimal maintenance to remove safety issues.	2,3	1,2,3,4,5	4,D
521	Command Post	Ruin -- Minimal maintenance to remove safety issues.	2	1,2,3,4,5	4,D
S9132, S2117	Seaplane Ramps.	Ruin – Minimal maintenance to remove safety issues; affected by sea level rise.	2	4,5	4,D
E-2 (E-21)	Underground Bunker, east of runway	Ruin – Minimal maintenance to remove safety issues;	2,3	4,5	4,D
E-7, E-8	Possible Gun Positions, south shore.	Ruin– Minimal maintenance to remove safety issues; affected by sea level rise.	2,3	4,5	4,D
S-8	Torpedo and Bomb	Museum Property: artifact for interpretation	4	1,4	4,D
E-4	Metal Pillbox (turret)	Museum Property: artifact for interpretation	4	1,4	4,D
E-5	Submarine Netting	Museum Property: artifact for interpretation	4	1,4	4,D
E-10 to E-48		Evaluate for NRHP eligibility.		4,5	undetermined

¹2-Implement, supervise, and monitor the treatments in the HPP-2010; 3-Prepare an updated Battle of Midway NHL nomination by 2014; 4-Improve the function and capacity of the Midway museum by 2018; 5-Document and inventory historic resources beyond Midway Atoll NWR within 15 years; 6-Conduct archaeological and historical research by 2025.

²1-Protect, maintain and interpret historic resources; 2-Follow Sec. of Interior Standards to protect and maintain NR-eligible properties; 3-Follow Sec. of Interior Standards to protect and maintain NR-eligible landscape features; 4-Follow NHPA in the treatment of historic properties; 5-Salvage materials and leave footprints or ruins for interpretation that are safe and compatible with wildlife; 6-Explore adaptive re-use of historic buildings; 7-Document and inventory maritime heritage resources.

6.4 Summary

Historic properties on Midway Atoll NWR are unique and for the most part in need of some type of rehabilitation, stabilization, mothballing, or minimal maintenance to meet the requirements of the NHPA, the MMP, the CSP, and the VSP goals. This HPP-2010 offers a succinct approach for matching the operational needs of the refuge with the other partners and plans that overlay Midway. Table 6.1 offers the recommended treatments, prioritized historic resource value, physical condition, and ability to meet a need or goal. This table and the treatment options discussed in Chapter 5 should provide the necessary background to make informed, resource-based decisions.

One final caveat to this plan, as for any plan, is that if it is not implemented or used to arrive at decisions then it is a useless instrument. It is hoped that the rationale behind the HPP-2010 recommendations will be understood and the ranking and priority-based treatments will be accepted and linked to the genuine conservation of some of the nation's most significant historic properties.

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APPENDIX A

Table of Historic Properties with Treatment Recommendations and Goals.

List of Midway's Historic Properties with Theme, 1999 HPP, Condition Assessments, Treatment Recommendations, Goals, and Replacement Cost.

Bldg. No.	Common Name	Theme	HPP 1999	Condition Assessment 2004	Condition Assessment 2007	Lead Paint Status	Condition Assessment/ Status 2009	HPP-2010 Treatment Recommendation and Priority Ranking	MMP Goals ¹	CSP Goals ²	Replacement Cost Estimate and Asset Number
S2115	Seaplane Ramp	1940-1942	Reuse	Fair, in use	Fair, in use	None	In use, beginning to crack	Rehab for continued use. Affected by sea level rise. Rank: 1,A	2	1,2,3,4,6	N/A
151	Seaplane Hangar	Kahn architecture; 1940-1942	Reuse	Cooperator using.	Top priority for rehab. Used for boat and equip. storage	Yes, not treated	In use for storage of boats and equip. Holes in roof, rear wall collapsing, concrete wall spalling and cracking. See Mason/Chock Cond. Assess. Rpt 2009	Stabilize so that building can continue to be used for large equip and boat storage. \$14-23 mil Rank 1, A	2,3	1,2,3,4,6	\$19,681,162 (10001985)
414,	OIC, Senior	Kahn architecture; 1940-1942	Reuse	FWS and Cooperator using.	Roof, gutter repairs, interior paint. Completed Sec. 106	Yes, exterior encapsulated, 2009.	In use, good, but roof leaks, termite damage.	Rehab for continued use. Rank 1, A	2	1,2,3,4,6	1,953,636 (10002025)
415, 416, 417, 418, 419, 421, 422, 423, 424	Officers' Quarters	Kahn architecture; 1940-1942	Reuse	New roof, gutter repair. Completed Sec. 106	Roof leaking, abandoned, taken off grid	Yes, treated, encapsulated 2009	In Use, ARRA funded rehabilitation. New roof, solar panels, interior complete rehab. Completed Sec. 106.	Continue to use and maintain Rank 1, A	2	1,2,3,4,6	1,953,636 (10002026, 27,28, 29, 30, 31, 32, 33, 34)
356	General Squadron Storehouse, "Transportation bldg"	Kahn architecture; 1940-1942	Reuse	FWS and Cooperator using.	Good, in use	Yes, lead paint	In use, good. Refurbishing windows See Mason/Chock Cond. Assess. Rpt 2009	Rehab for continued use. Rank 1, A	2	1,2,3,4,6	8,357,563 (100020104) 1,096,305 repair
363	Torpedo Shop w/parachute tower	Kahn architecture; 1940-1942	Secure	Cooperator using.	In use, storing recycled materials.	Yes, not treated	In use for storing recycled materials. Repairs needed to roof, windows, concrete beginning to crack.	Rehab. for adaptive reuse such as an office/shop Rank 2, A	2	1,2,3,4,6	2,981,114 (10002018)
342	Paint and Oil Storehouse	Kahn architecture; 1940-1942	Secure	Cooperator using.	In use by contract labor, concrete spalling, some roof damage.	Yes, treated, encapsulated 2009	In use by contract labor. Needs some maintenance.	Continue to use and maintain. Rehab for use. Rank 2, A	2	1,2,3,4,6	1,567,674 (10002008)
S5247	Brackish Water Reservoir	1942-1945	Leave As-is	Leave As-is	Leave As-is	No	Adaptive reuse as a hazardous waste holding tank. Completed Sec. 106.	Holding tank. Rank 1, B	2	1,2,4,6	N/A

Bldg. No.	Common Name	Theme	HPP 1999	Condition Assessment 2004	Condition Assessment 2007	Lead Paint Status	Condition Assessment/ Status 2009	HPP-2010 Treatment Recommendation and Priority Ranking	MMP Goals ¹	CSP Goals ²	Replacement Cost Estimate and Asset Number
349	Commissary and Cold Storage	Kahn architecture; 1940-1942	Reuse	Cooperator using.	In use, good	Yes, treated, encapsulated 2007	In use, roof needs some attention. See Mason/Chock Cond. Assess. Rpt 2009	Continue to use and maintain. Rehab.equip. for use. Rank 1, B	2	1,2,4,6	5,555,020 (10002010) 452,275 repair
S3126, S3127	Water Reservoirs	1942-1945	Reuse	Cooperator using.	In use, good	No	In use, repainted and maintained	Continue to use and maintain. Rank 1, B	2	1,2,4,6	N/A
361	Electrical Switch Station	1942-1945	Reuse	Good, in use	Good, in use	Yes, untreated	In use, pesticide storage, concrete spalls, cracks, paint flaking	Maintain for continued use. Rank 4, B	2	1,2,3,4,6	360,750 (10002017)
393	Public Works Storehouse	1942-1945	Reuse	Cooperator and FWS using.	In use. Roof repair needed, concrete cracking.	Yes. Scraped but not painted.	In use for storage, roof poor, concrete spalling and cracking. See Mason/Chock Cond. Assess. Rpt 2009	Dismantle and replace with new structure on concrete pad. Rank 1, B	2	1,2,3,4,6	7,362,693 (10002019) 1,956,939 repair
S6194	ARMCO hut (NHL Structure)	Battle of Midway	Secure	Navy (1997) removed original doors; building not secured.	New front panels 2001 (SAT). Needs painting and roof repair. Completed Sec. 106.	No, unpainted.	Mothball. Rehabilitated, new panels 2002, painted, 2007. Continue maintenance. Interp. potential.	Continue to maintain for interp. Rank 3, A (NHL)	2,3	1,2,3,4	7,216 (10002130)
357	Torpedo Shop (Machine shop)	Kahn architecture; 1940-1942	Reuse	Cooperator using.	Not in use. Lead paint removal gouged wood siding, rear portion extensive termite damage.	Yes, partially abated; critical damage by removal method.	Mothball, severe termite damage to rear portion. Has 1940s machinery. need to move machinery to safe location.	Dismantle rear portion. Save front portion and rehab for adaptive reuse. Mothball front portion. Rank 3, A	2,4	1,2,3,4,5,6	2,238,976 (10002015)
259	Theater and Offices	Kahn architecture; 1940-1942	Reuse	New roof, window rehab. 2001 SAT grant, in use	Termite treatment, Fair.	Yes, untreated, except windows that were rehab.	Mothball theater and offices. 1-story shop wing in use. Termites, lead paint, asbestos tiles	Rehab for use as theater/public use; offices. Rank 3, A	2,4	1,2,3,4,6	8,732,068 (10001993)
S-1	5-inch Gun Battery C - "Charlie" (NHL structure)	Battle of Midway	Leave As-is	FWS built trail, metal conservation completed 1998 and vegetation cleared. Battery included in interpretation of Battle.	Trail no longer maintained.	No, unpainted.	Minimal Maintenance. Concrete is cracking and battery needs to be braced. Metal needs treatment again.	Rehab. for interpretation. Treat metal every few years, repair cracks in concrete and support battery wall. Rank 4, A (NHL)	2,3	1,2,3,4,5	5,756 (10002160)

Bldg. No.	Common Name	Theme	HPP 1999	Condition Assessment 2004	Condition Assessment 2007	Lead Paint Status	Condition Assessment/ Status 2009	HPP-2010 Treatment Recommendation and Priority Ranking	MMP Goals ¹	CSP Goals ²	Replacement Cost Estimate and Asset Number
S-2	3-inch gun Battery D - "Dog" (NHL structure)	Battle of Midway	Leave As-is	FWS cleared vegetation, planning conservation of metal.	Overgrown again.	No, unpainted.	Minimal Maintenance. Overgrown with veg.	Rehab. for interpretation. Treat metal every few years, repair cracks in concrete. Rank 4, A (NHL)	2,3	1,2,3,4,5	5,756 (10002161)
S-3	Pillbox (NHL structure) near S7125.	Battle of Midway	Leave As-is; Navy filled with sand.	Status unchanged.	Status unchanged.	No, unpainted.	Minimal Maintenance. Filled with sand, beginning to crack and deteriorate.	Rehab. for interp. Rank 4, A (NHL)	2,3	1,2,3,4,5	5,756 (10002170)
S-6	Pillbox, south shore (NHL Structure)	Battle of Midway	Leave As-is	Leave As-is	Good, steps down to beach from cart trail. Interpreted.	No, unpainted.	Minimal Maintenance. Fair condition, concrete beginning to crack, part of front broken, sea water eroding base.	Rehab. and move higher on beach to keep out of water and interpret. Rank 4, A	2,3	1,2,3,4,5	5,756 (10002165)
S7124	ARMCO hut (NHL structure)	Battle of Midway	Navy (1997) secured structure by placing clear plexiglass panels across front. This securing method is causing deterioration of metal - 1998.	Secured, metal front panel beginning to deteriorate behind panel.	Area cleared around hut, roof has a hole, metal deteriorating slowly.	No	Mothball . Area cleared around hut, roof has a hole, metal deteriorating slowly. Hut is on cart trail. Front panel very deteriorated.	Rehab. for interpretation. Fabricate new panels and install. Patch roof and cover with sand. Provide more interp. Rank 4, A (NHL)	2,3	1,2,3,4,5	7,216 (10002133)
S7125	ARMCO hut (NHL structure)	Battle of Midway	Navy (1997) secured structure by placing white plexiglass panels across front. This securing method is causing deterioration of metal - 1998.	Poor job of securing, front panels are deteriorating rapidly.	Front panels collapsing, holes in roof.	No	Mothball. Deteriorating rapidly.	Probably no longer viable to restore or rehab. Allow to deteriorate to ruin. Rank 4, A (NHL)	2,3	1,2,3,4,5	7,216 (10002134)
643	Cable Station-Mess Hall	Colonization	Secure	Abandoned, not secured in 1997.	New roof in 2001 (SAT). Supports for corners of verandah, concrete cracking, metal deteriorating. Completed Sec. 106.	Yes, not treated	Mothball . Can be rehabilitated for use to interpret this era.	Rehab. for interpretive/adaptive reuse. Rank 4, A	2,6	1,2,3,4,6	131,132 (10002049)

Bldg. No.	Common Name	Theme	HPP 1999	Condition Assessment 2004	Condition Assessment 2007	Lead Paint Status	Condition Assessment/ Status 2009	HPP-2010 Treatment Recommendation and Priority Ranking	MMP Goals ¹	CSP Goals ²	Replacement Cost Estimate and Asset Number
N/A (S-9)	5-inch Gun Battery A - Able (SW end of beach)	Battle of Midway	Not included in PA or NHL study.	FWS built trail, treated metal in 1999.	Trail overgrown, batteries still in fair condition, beginning to crack.	No, unpainted.	Minimal Maintenance. Fair condition, concrete cracking, metal needs to be treated. Veg needs to be cleared.	Rehab for interpretation. Needs to be evaluated to NRHP and NHL. Rank 4, A New addition to HPP	2,3	1,2,3,4,5	5,756 (10002162)
6-24, 12-30, 3-21	Eastern Island Runways	Battle of Midway	Leave As-is	Leave As-is	runways overgrown with veg.	No	Ruin. Runways overgrown with veg. difficult to see them.	Minimal Maintenance to remove veg. from a strip on each runway to mark runway for interpretation. Rank 4, A	2,3	1,2,3,4,5	N/A
S-7	Metal Pillboxes, north side on inner harbor	Battle of Midway	Filled with sand.	Same.	Metal beginning to deteriorate from rust.	No	Minimal Maintenance. Filled with sand, metal deteriorating. Ironwoods removed.	Minimal Maintenance, regrade area around them, put down landscape cloth, treat metal for rust, interp. Rank 4, A	2,3	1,2,3,4,5	5,756 (10002166)
578, 579	Barracks	Kahn architecture; 1940-1942	Reuse	Cooperator planning to rehab.	Mothball	Yes, untreated & asbestos	Mothball, asbestos, lead paint, structural issues.	Salvage and Dismantle. Rank 4,A	2	1,2,3,4,5	1,443,000 (10002043)
353	Carpentry Shop	Kahn architecture; 1940-1942	Reuse	Cooperator using.	Mothball	No, Lead paint abated.	Mothball, structural issues with termites.	Salvage and Dismantle. Rank 4,B	2	1,2,3,4,5	1,963,366 (10002010)
E-3	Metal Pillbox, Eastern Island	Battle of Midway	Fill	FWS has removed sand from interior and is using pillbox in interpretation, 1999.	Structure filled with sand, overgrown with veg.	No	Minimal Maintenance. Filled with sand, overgrown with veg. Metal deteriorating.	Regrade area around, put down landscape cloth, treat metal for rust, interp. Rank 4, A	2,3	1,2,3,4,5	5,756 (10002155)
5187	Radar Tower bunker and base.	1942-1945	Secure	Navy closed off doors (1997).	Concrete spalling, doors sealed.	No, unpainted	Mothball	Mothball. Rank 4, B	2	1,2,3,4,5	23,720 (10002130)
631	Small Radar Building	1942-1945	Navy (1997) left as-is.	Left open.	Fairly good condition of walls, roof deteriorating.	No, unpainted.	Mothball	Mothball. Rank 4, B	2	1,2,3,4,5	39,138 (10001993)
S956	Underground Shelter	Battle of Midway	Navy (1997) left as-is.	Left open.	Good, open for interpretation. Needs maintenance of doors and concrete beginning to crack.	No, just doors are painted. Could be repainted to encapsulate lead.	Mothball, open for interpretation.	Rehab. for interpretation. Rank 4, B	2,3	1,2,3,4,5	7,216 (10002050)

Bldg. No.	Common Name	Theme	HPP 1999	Condition Assessment 2004	Condition Assessment 2007	Lead Paint Status	Condition Assessment/ Status 2009	HPP-2010 Treatment Recommendation and Priority Ranking	MMP Goals ¹	CSP Goals ²	Replacement Cost Estimate and Asset Number
S2123	Plaque in Midway Memorial	1942-1945	Leave As-is	Leave As-is.	Minimal maintenance.	Unknown status	Minimal maintenance.	Maintenance and increased interp. Rank 4, B	2,4	1,2,3,4	N/A
S2409	Two 5-inch Naval guns in Midway Memorial	1942-1945	Leave As-is	One gun treated with rust preventative and painted, 1998. Second gun treated in 1999.	Minimal maintenance.	No, treated.	Minimal maintenance.	Maintenance and increased interp. Rank 4, B	2,4	1,2,3,4	N/A
E-6	Revetments	Battle of Midway	Leave As-is	Leave As-is	Beginning to be overgrown with veg.	No	Ruin. Eroding or covered with veg.	Minimal Maintenance, rehab 1-2 for interp. and keep clear of veg. Rank 4, B	2,3	1,2,3,4,5	(10002156)
E-1	3-inch Anti-Aircraft Gun	1942-1945	Leave As-is	Metal conservation completed 1998.	Gun in fair condition, beginning to rust where paint is cracking.	No, treated.	Minimal Maintenance. Needs to be maintained with rust prevention treatment.	Minimal Maintain for interp. Rank 4, B	2	1,2,3,4	5,756 (10002153)
S-4	Cemetery: Bauer Road	No theme	Leave As-is	FWS has built trail to cemetery and is maintaining cemetery.	New low wall, black cloth over cemetery, concrete walkway to cemetery.	No	Minimal Maintenance. Beginning to be overgrown with veg.	Minimal maintenance and interpretation. Rank 4, C	2	1,2,3,4	5,756 (10002163)
S-5	Three Japanese Memorials	No theme	Leave As-is	FWS cleared path to memorials with cloth.	Maintained with landscape cloth.	No	Minimal Maintenance.	Minimal maintenance and interpretation. Rank 4, C	2	1,2,3,4	5,756 (10002164)
628, 619, 623	Cable Station bldg Complex.	Colonization	Secure	Abandoned, not secured in 1997.	Abandoned, some attempts to mothball bldgs. Deteriorating rapidly.	Yes, not treated.	Change in status to salvage/dismantle to ruin, Completed Sec. 106 with SHPO, Ad. Council, groups, 2007.	Dismantle to ruin. Clean up site to allow interp. Leave concrete walls. Rank 4,D	2,6	1,2,3,4,5	60,000 (10002047, 10002044, 10002045)
626	Cable Station bldg	Colonization	Leave As-is	Leave As-is	Ruin.	Yes, not treated.	Ruin.	Ruin, needs to be cleared of hazardous materials and included in interp. Rank 4, D	2,6	1,2,3,4,5	20,000 (10002046)
144	Diesel Power Plant and Salt Water Pumping Station	1942-1945	Secure	Navy secured in 1997.	Abandoned, concrete spalling and cracking.	No, unpainted.	Mothball, continuing to slowly deteriorate.	Continue mothball or Minimal maintenance. Rank 4, D	2	1,2,3,4,5	N/A
354	Power Plant	Battle of Midway	Secure	Navy secured in 1997.	Mothball status, concrete spalling.	No, unpainted	Mothball, continuing to slowly deteriorate.	Continue mothball status. Rank 4, D	2,3	1,2,3,4,5	N/A
521	Command Post	1942-1945	Secure	Navy secured in 1997.	Mothball status, concrete spalling.	Yes, not treated	Mothball, continuing to slowly deteriorate.	Continue mothball status. Rank 4, D	2	1,2,3,4,5	N/A

Bldg. No.	Common Name	Theme	HPP 1999	Condition Assessment 2004	Condition Assessment 2007	Lead Paint Status	Condition Assessment/ Status 2009	HPP-2010 Treatment Recommendation and Priority Ranking	MMP Goals ¹	CSP Goals ²	Replacement Cost Estimate and Asset Number
S9132, S2117	Seaplane Ramps.	1940-1942	Leave As-is	Leave As-is	Leave As-is.	No	Ruin. S9132 broken and deteriorating to ruin. S2117 not observed, covered by 1960s runway extension.	Minimal maintenance. Allow to deteriorate. Rank 4, D	2	4,5	N/A
E-2 (E-21)	Underground Bunker, east of runway	Battle of Midway	Leave As-is	Not observed.	Not observed.	No	Ruin (filled with sand)	Ruin Rank 4, D	2,3	4,5	(10002154)
E-7, E-8	Possible Gun Positions, south shore.	Battle of Midway	Leave As-is	Leave As-is	Eroding off of beach.	No	Ruin. Eroded, concrete chunks, slabs on beach.	Ruin, no treatment options. Rank 4, D	2,3	4,5	(10002157 and 58)
S-8	Torpedo and Bomb	1942-1945	Relocate	Items remain on display in terminal.	Items remain on display in terminal.	No	Relocate. Items remain on display outside terminal.	Move items to secure location. Treat as museum property. Rank 4,D	4	1,4	N/A
E-4	Metal Pillbox (turret)	1942-1945	Relocate	Navy (1997) moved object to Sand Island.	Two metal turrets stored in bone yard.	No	Relocate. In bone yard, metal deteriorating.	Rehab., treat metal, set up as a museum artifact for interpreting how they were used during WWII. Rank 4,D	4	1,4	N/A
E-5	Submarine Netting	1942-1945	Relocate	Navy (1997) moved object to Sand Island.	Netting and wood float stored in bone yard.	No	Relocate. In bone yard.	Rehab., set up as a museum artifact for interpreting how they were used during WWII. Rank 4,D	4	1,4	N/A

¹MMP Goals

2-Implement, supervise, and monitor the treatments in the HPP-2010;
3-Prepare an updated Battle of Midway NHL nomination by 2014;
4-Improve the function and capacity of the Midway museum by 2018;
5-Document and inventory historic resources beyond Midway Atoll NWR within 15 years; and
6-Conduct archaeological and historical research by 2025.

²CSP Goals

1-Protect, maintain and interpret historic resources;
2-Follow Sec. of Interior's Standards to protect and maintain NR-eligible properties;
3-Follow Sec. of Interior's Standards to protect and maintain NR-eligible landscape features;
4-Follow NHPA in the treatment of historic properties;
5-Salvage materials and leave footprints or ruins for interpretation that are safe and compatible with wildlife;
6-Explore adaptive re-use of historic buildings; and
7-Document and inventory maritime heritage resources.

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